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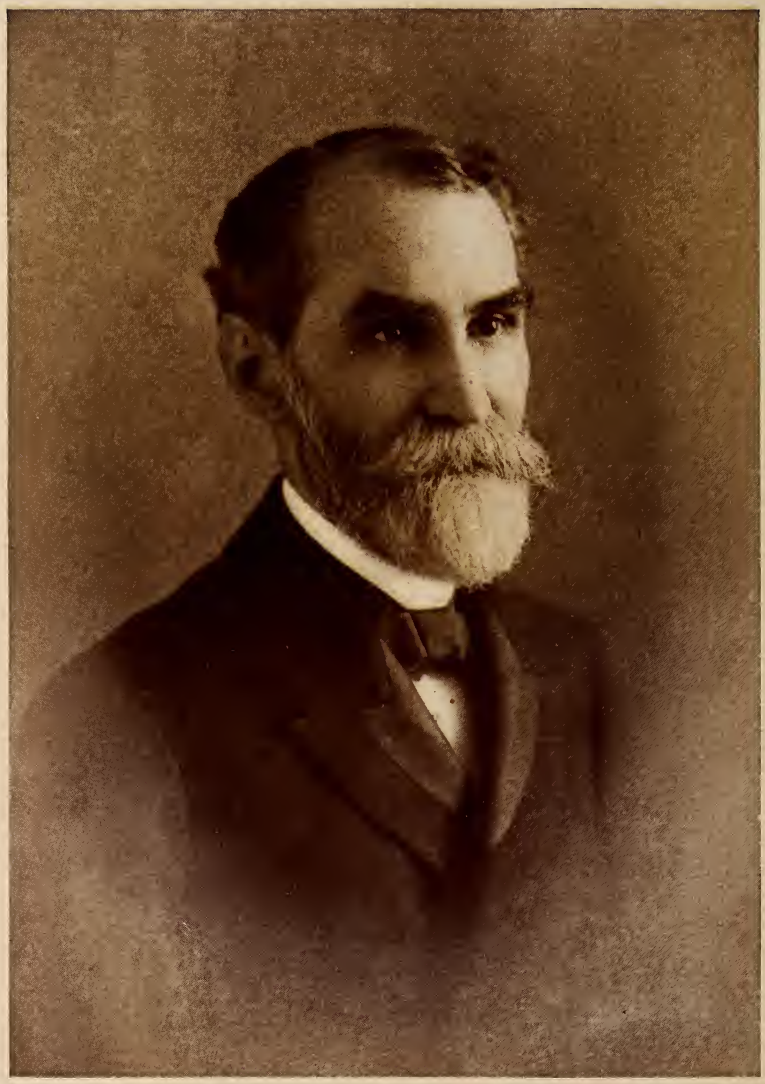

N. R. Coleman

THE OHIO STATE MEDICAL SOCIETY

TRANSACTIONS

OF THE

FIFTY-FOURTH ANNUAL MEETING

HELD AT

SPRINGFIELD, OHIO

MAY 10, 11, 12, 1899

EDITED BY

P. MAXWELL FOSHAY, M. D.

CLEVELAND

PRESS OF J. B. SAVAGE,

CLEVELAND.

THE

FIFTY-FIFTH ANNUAL MEETING

OF THE

OHIO STATE MEDICAL SOCIETY

WILL BE HELD IN

COLUMBUS

MAY 9, 10 AND 11, 1900

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NOTE

The Revised Constitution and By-Laws of Ohio State Medical Society may be found at the back of the volume of Transactions for 1898. No changes having been made in them since their publication at that time it was not thought advisable to put the Society to the expense of republishing them in the present volume.

OFFICERS
OHIO STATE MEDICAL SOCIETY

PRESIDENT.....RUFUS B. HALL, M. D., Cincinnati
FIRST VICE PRESIDENT.....JOHN H. ROGERS, M. D., Springfield
SECOND " " .....C. E. BEARDSLEY, M. D., Ottawa
THIRD " " .....D. C. WILSON, M. D., Ironton
FOURTH " " .....S. B. MCGAVRAN, M. D., Cadiz
SECRETARY.....JOHN A. THOMPSON, M. D., Cincinnati
TREASURER.....JAMES A. DUNCAN, M. D., Toledo
ASSISTANT SECRETARY.....H. M. PLATTER, M. D., Columbus

COMMITTEES

Finance

J. G. F. HOLSTON, M. D. (95) H. J. HERRICK, M. D. (96)
J. E. COOK, M. D. (97) H. A. ZIMMERMAN, M. D. (98)
W. J. CONKLIN, M. D. (99)

Ethics

J. C. REEVE, Sr., M. D. (95) T. C. HOOVER, M. D. (96)
DAN MILLIKIN, M. D. (97) R. B. HART, Jr., M. D. (98)
D. R. SILVER, M. D. (99)

Publication

J. E. BROWN, M. D. (95) F. D. BAIN, M. D. (96)
P. M. FOSHAY, M. D. (97) J. M. FRENCH, M. D. (98)
J. P. SAWYER, M. D. (99)
RUFUS B. HALL, M. D., JOHN A. THOMPSON, M. D., *Ex-officio.*

Legislation

GEORGE A. COLLAMORE, M. D. (95) CHARLES GRAEFE, M. D. (96)
J. A. KIMMEL, M. D. (97) D. N. KINSMAN, M. D. (98)
N. P. DANDRIDGE, M. D. (99)

Committee on National Medical Legislation

L. B. TUCKERMAN, M. D.

Admission and Medical Societies

A. B. RICHARDSON, M. D. (95) OSCAR HASENCAMP, M. D. (96)
J. E. RUSSELL, M. D. (97) THOMAS HUBBARD, M. D. (98)
FRANK WINDERS, M. D. (99)

Growth and Prosperity

WM. H. HUMISTON, M. D. C. L. BONIFIELD, M. D.
term expires 1903. term expires 1902.
S. S. HALDERMAN, M. D. 1901. FRANK WARNER, M. D. 1900.
W. C. CHAPMAN, M. D. (99)

Committee of Arrangements for Columbus Meeting, 1900

FRANK WARNER, M. D. NELSON OBETZ, M. D.
CLOVIS M. TAYLOR, M. D. E. J. WILSON, M, D.
A. H. BOWEN, M. D.

OHIO STATE MEDICAL SOCIETY

At the Seventeenth Annual Meeting of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

Chapter I—The Minutes

The fifty-fourth annual meeting of the Ohio State Medical Society was called to order in the council chamber of the city building, Springfield, at 1 P. M., May 10, 1899, by President Coleman. Prayer was offered by the Rev. Geo. H. Fullerton. The address of welcome was then delivered by Dr H. H. Seys.

ADDRESS OF WELCOME

Mr President and Gentlemen:

In the name of the Clark County Medical Society, which I have the honor to represent, and with infinite pleasure, I extend to you one and all a most cordial greeting and hearty welcome to our city and its hospitality.

Well do we know how difficult it is for the average doctor to escape from the thraldom of his profession; how hard it is for him to lay aside the cares, duties and labors that his high sense of duty and sometimes necessities impose upon him.

Few of us, I take it, believe that the average doctor is wafted to "mansions in the skies on flowery beds of ease," but rather that the few of our profession who eventually reach the Isles of the Blest, will at once take seats with those "who come out of great tribulation." Therefore it is our earnest wish, as it has been the motive of our labor for months past, to make this meeting of your society one of the most enjoyable in its history—one long to be remembered; a pleasant memory ever to be cherished.

Not on the juice of the sleep-compelling poppy shall I feed you. Full enough of hypnotics will, I doubt not, be served to you by those who come after me, and whose

pockets are bursting with bulky rolls of manuscript, to which perforce you must listen.

Had I however the power, I would gladly make this, our city, like unto the land of the Lotus-eaters, tnat you might feed on the seeds of that mysterious plant, and then forgetting all cares and labors of the past—weary days and nights of anxiety and toil—be lulled to delicious dreams and forgetting all past gatherings in honor of Hermes and Hippocrates, remember only Springfield, her people, and her hearty welcome.

That the greater contains the lesser, is, I believe, a principle in philosophy. So the State contains the county, the county contains Springfield, but the Ohio State Medical Society represents the State.

As to Springfield, we who are native and to the manor born, look on this our home as not the least of the smaller cities of our grand State.

Our population is about 40,000; our death-rate is 10.84; we are third in the State as to the mail matter sent out; there are not two score of vacant houses in our limits, and our factories running to their fullest capacity; not a few of them night and day, and their products known in every land and among all people.

On our roll of fame are names that will not perish from the memory of man so long as our city shall live, or men delight to honor those who love their fellow-men.

Where shall be found a finer type of the true gentleman than the late Benjamin H. Warder, who donated to our city the beautiful Warder Library, and many are our obligations to Oliver S. Kelly, who gave us the beautiful fountain you will daily see.

What city of our size in this or any State has received a more superb benefit than we, in the gift from John and David L. Snyder, who not only gave us our beautiful park, but also $225,000 for its maintenance and ornamentation, and then placed our people at their feet by endowing our

Mitchell-Thomas Hospital, (it, the gift of two of our generous citizens) with $100,000 in U. S. bonds, in order as they dictated, that the poor of our city should have the best of care and attendance when sick, without fee or expense?

The beautiful homes for the care of the old and young, belonging to the Masons, Knights of Pythias, and Odd Fellows, are lasting monuments to the generosity of our people.

Our Young Men's Christian Association but a few days since received $10,000 from each of two of our good citizens, Asa S. Bushnell, our esteemed governor, and E. S. Kelly, a worthy son of a worthy sire, toward the building of their new Home. Governor Bushnell was also a most potent factor in securing us the Masonic Home, by his timely and generous gift of $10,000.

Our city water is pure, clear and cold; practically inexhaustible, and virtually free from any danger of organic contamination. Two and one-half million gallons are furnished us daily, and the plant, owned by the city, can pour out thirteen million gallons per diem, should it be required.

Nature has done much for us. Our city is bisected by the beautiful Lagonda and again by the more plebeian Mill Run, furnishing us most excellent natural drainage. So much in praise of the city to which we welcome you.

Of our county, I shall say only this: Its magnificent soil, its pure water, its inexhaustible beds of gravel and limestone, its beautiful prairies and rolling hills make it a proper setting for our beautiful city. Of our grand State I need say but little. Fame on swift wings has spread its name from pole to pole, and the great men we have furnished to every profession and art have their names written among the immortals.

Grant, Sherman, Sheridan, Garfield, Hayes, our loved McKinley, Drake, Blackman, Mussey, and a host of others are names not born to die.

But I fear some of you are saying that this is the first dose of the poppy-juice we were promised should not be given us. Lest this should be the case I close, and in the name of the Clark County Medical Society and of the citizens of Springfield, I again bid you welcome, thrice welcome to our city, our homes and our hospitalities.

This was responded to by President Coleman.

RESPONSE TO ADDRESS OF WELCOME

Dr Seys and citizens of the City of Springfield:

On behalf of the Ohio State Medical Society I thank you for the very kind words of welcome you have extended to us. The hospitality, the greatness, the beauty of Springfield are too well known to require any words of explanation. They are known to all the physicians of the State, therefore the words of welcome from Dr Seys are highly appreciated. We are now assembled from all parts of the State, we are here to enjoy for a brief time the association of each other, here for the purpose of mutual improvement, for mental and physical recreation. In the association of physicians we find strength, we find harmonious action, we find love springing up, and when you combine all these forces (they may be classed as sentiments), they make a mighty factor and accomplish all that can be accomplished for the higher and greater action of our profession.

We mean to appropriate all that has been offered us, for instance the pure water—I suppose that will be relished by all. We have been assured that there is plenty of it. I heard of nothing stronger and I take it that that is the extent in that line. We will appropriate as far as our time and your indulgence will permit the privilege of visiting your office buildings, your parks, your beautiful streets, and your libraries, in which we are interested.

We are gathered here for the purpose, as I stated, of

mutual improvement, but we have still a higher purpose to become more familiar with the peculiarities and methods of each other and to exchange ideas, and to be more thoroughly prepared to discharge our duties when we return home. I have no doubt that when the time arrives for us to take our departure we will carry with us the most pleasant remembrance of our visit and only regret that our stay has been so brief. In conclusion I thank you earnestly for the kind invitation extended.

On motion of Dr C. A. L. Reed, the privileges of the floor during the meeting were extended to Dr P. R. Bennett of Daytona, Florida. The report of the Committee of Arrangements was then made by Dr John W. Hulick, Chairman.

REPORT OF COMMITTEE OF ARRANGEMENTS

Mr Chairman:

The Committee of Arrangements beg leave to report as follows:

1. You have never met in session with a people who more heartily welcome you than the people of Springfield. Through the generosity of our members of the Clark County Medical Society, and a number of our good citizens, it has been as easy matter to raise funds, more than enough to entertain our State society.

2. We have secured for this meeting the use of our Council Chamber, with its seating capacity of 600 persons, as being the most convenient and desirable room for this purpose.

3. For the exhibitors we have had arranged the Armory Hall adjoining, and have endeavored to supply them with every convenience necessary to their comfort.

4. In our efforts to secure a large and enthusiastic at-

tendance at this meeting, we have sent out to the regular physicians of the State 5,500 circular letters, and have responded in answer to not less than 150 personal letters of inquiry made since that time. No less than 17 of these were for information concerning applications for membership and have been referred to Dr Duncan, Treasurer, at Toledo.

5. For your entertainment we have arranged a reception for Wednesday evening at the Lagonda Club House, where our townspeople will welcome you most heartily we are sure.

6. Our Annual Banquet will be given on Thursday evening at the Arcade hotel. Our toasts have been arranged with great care, and we can promise you an enjoyable evening.

7. It has also been arranged with the Street Railway Company for a trolley-ride over the city, and those wishing to spend an hour in this way, will kindly report at north entrance of Arcade at 8 A. M. on Friday.

The President then appointed as the Committee on Nominations, Drs C. E. Beardsley, Ottawa; C. A. L. Reed, Cincinnati; John W. Hulick, Springfield; P. M. Foshay, Cleveland; Jehu Eakins, Patriot.

A paper, "The Differential Diagnosis of Smallpox," was read by Dr Wm. Thos. Corlett of Cleveland, and was discussed by Drs D. N. Kinsman, C. E. Beardsley, C. O. Probst, B. H. Blair, P. R. Bennett, G. W. Crile, E. Gustave Zinke, and the discussion closed by the author.

A telegram was read from Dr H. M. W. Moore, Assitant Secretary, saying that he had not been mustered out of the army service and could not attend. It was moved by Dr H. H. Seys that Dr Coates of Springfield be employed as Assistant Secretary. Motion was carried.

A paper, "Why does the Surgeon Fail to Find the Appendix?" was read by Dr N. Stone Scott of Cleveland.

A paper, "When Should the Physician Call the Sur-

geon in Appendicitis?" was read by Dr Allen H. Vance of Springfield.

A paper, "Surgical Appendicitis," was read by Dr B. M. Ricketts of Cincinnati.

A paper, "Appendicitis," was read by Dr Hugh F. Lorimer of Fair Haven. The subject of these papers was discussed by Drs C. A. L. Reed, Mary J. Finley, H. G. Sherman, G. W. Crile, C. N. Smith, Edwin Ricketts, Arthur W. Johnstone, Thad. A. Reamy, B. E. Sager, J. F. Baldwin, D. N. Kinsman, and the discussion closed by the authors of the papers.

A paper, "Sixty-five Consecutive Abdominal Sections Without a Death," was read by Dr Hunter Robb of Cleveland. This was discussed by Drs G. W. Crile, C. A. L. Reed, W. H. Humiston, and the discussion closed by the author.

The President filled the Committee on Admissions and Medical Societies, the only member present being W. C. Chapman, Chairman, by the appointment of Drs Frank Winders, J. F. Baldwin, Geo. W. Crile, and C. O. Probst to fill the vacancies.

A paper, "Something About Phagocytes," was read by Dr D. N. Kinsman of Columbus.

The Committee on Admissions made a partial report. The applicants reported favorably by the Committee were on motion elected to permanent membership in the Society. The name of Dr Albert P. Black was referred to the Committee for investigation as to the standing of the school from which he graduated. The Society then adjourned.

MORNING SESSION, THURSDAY, MAY 11

The meeting was called to order by President Coleman at 9 A. M. The minutes of the previous meeting were read and approved.

A paper, "Gastric Disorders Producing Constipation and Diarrhea," was then read by Dr John P. Sawyer of Cleveland. This paper was discussed by Dr L. B. Tuckerman and the discussion closed by the author.

The Committee on Finance, the only member present being Dr N. P. Dandridge, Chairman, was filled by the appointment of Drs G. A. Collamore, D. C. Wilson, W. H. Taylor, and S. B. McGavran.

A paper, "Milk as a Carrier of Infection," was read by Dr C. O. Probst. This paper was discussed by Drs H. J. Sharp, John P. Sawyer, John A. Thompson, W. C. Chapman, C. F. Clark, and A. F. House.

Dr C. F. Clark offered the following resolution: Resolved, that a Committee, of which Dr Probst shall be a member, be appointed by the Chair, who shall withdraw from the meeting and formulate resolutions on the subject of legislation for the correction of the unsanitary condition of dairies and the prevention of the dissemination of disease through dairy-products, and that they report during the present session of the State Medical Society, to the end that immediate action may be taken by the Society. This motion was carried. The President appointed as such committee Drs C. O. Probst, C. F. Clark and L. B. Tuckerman.

A paper, "What Should be the Attitude of the Profession Toward Christian Science and Other Fads?" was then read by Dr John C. Oliver of Cincinnati. This paper was discussed by Drs P. M. Foshay, C. A. L. Reed, Thad. A. Reamy, F. F. Lawrence, E. S. Stevens, P. R. Bennett, and the discussion closed by the author.

The Committee on Admissions made a partial report and on motion the applicants whose names were reported favorably were elected to permanent membership.

A paper, "The Prevention of Infection in and After Labor," was read by Dr Wm. H. Taylor of Cincinnati. This paper was discussed by Drs E. G. Zinke, F. F. Lawrence,

Frank Warner, John P. Sawyer, P. R. Bennett, and the discussion was closed by Dr Taylor.

The Springfield Academy of Medicine presented an application for auxiliary membership. This was referred to the Committee on Admissions and Medical Societies.

A paper, "The New Economic Position of Woman in its Relation to Health and Vigor," was read by Dr Mary J. Finley of Mansfield. The paper was discussed by Drs T. A. Reamy, J. F. Fitzsimmons, L. F. House, and the author.

A paper, "The Regular and Periodic Disinfection of Railway Passenger Coaches and Street Cars," was read by Dr Frank Warner of Columbus.

It was moved by Dr W. J. Means that a committee be appointed to prepare resolutions expressing the opinion of the Society on disinfection of public conveyances, the committee to report in the afternoon session. This motion was carried, and the Society then adjourned to 1:30 P. M.

THURSDAY AFTERNOON, MAY 11

The Society was called to order by President Coleman at 1:30 P. M. The minutes of the morning session were read and approved.

The report of the special committee on the spread of infection through dairy products was read and approved.

REPORT OF THE SPECIAL COMMITTEE ON CONTAMINATION OF DAIRY PRODUCTS

"Resolved, that it is the experience of the members of this Society, that the prevalence of tuberculosis among cattle is a menace to the public health by the unregulated sale of tuberculous meat and especially of tuberculous milk.

1. That it is the sense of this Society that the sanitation of dairies should be subject to rigid inspection and con-

trol by the public health authorities, such control to include segregation or condemnation of tuberculous cattle and the exclusion of their products for sale or consumption except under regulations prescribed by the State Board of Health.

2. That the State Board of Health should be authorized to order the inspection of any dairy, both as to the housing and care of the cattle, and as to the presence of tuberculosis, by means of the tuberculin test or otherwise.

3. That an appropriation should be made to the Veterinary Department of the Ohio State University to enable that department to supply tuberculin in such quantities as may be necessary, and to conduct such investigations as the Board may advise.

4. That the State Board of Health should be authorized to prescribe and enforce proper construction of dairies, which should include lighting, heating and ventilation, and a proper supply of wholesome water, in order that the spread of tuberculosis among cattle may be the better controlled.

5. That a special committee be appointed to urge upon the next general assembly the passage of such laws as shall carry these resolutions into effect, which would not only tend to prevent the enormous financial losses now suffered by cattle owners from the spread of tuberculosis in their herds, but would also protect the users of milk, especially infants, against fatal infection."

The Committee on Admissions and Medical Societies reported favorably on the application of the Springfield Academy of Medicine for auxiliary membership. On motion the report was approved and the Academy elected as an auxiliary society.

The report of the Treasurer was read and referred to the Finance Committee.

TREASURER'S REPORT

Toledo, May 10, 1899

1893	Receipts	$2,074.19	Expenditures	$2,074.19
1894	"	1,596.95	"	1,596.95
1895	"	1,868.00	"	1,788.09
1896	"	1,628.00	"	1,708.12
1897	"	1,514.00	"	1,504.81
1898	"	1,442.00	"	1,392.89
	Balance on hand			58.09
		$10,123.14		$10,123.14

1898	Balance	$ 8.98
	Initiation fees	81.00
	Dues, membership	1,333.00
	Refunded, Legislation Committee	28.00
		$1,450.98

Disbursements:—

Dr	J. A. Thompson, Secretary		$230.55
	Salary	$125.00	
	Postage	45.75	
	Printing and Stationery	59.80	
Dr	Jas. A. Duncan, Treasurer		316.94
	Salary	125.00	
	Surety bond	7.50	
	Rubber stamp	1.00	
	Printing and Stationery	30.70	
	Postage	34.00	
	Freight and Express charges	117.74	
	Revenue stamps	1.00	
Dr	R. H. Reed, Editor		55.00
	(Balance, salary.)		
Dr	P. M. Foshay, Editor		8.10
	(Expenses and Postage.)		
Dr	H. S. Jones, Asst. Secy		10.00
	J. J Noland		25.00

Stenographic report, convention 1898....	65.00
Publication, transactions	619.05
Central Traffic Association	11.00
Printing and Stationery Ex. Com.	21.25
Fees and dues refunded	31.00
Balance on hand	58.09
	$1,450.98

(Signed) JAMES A. DUNCAN, Treas.

The report of the Secretary was read and ordered filed.

SECRETARY'S REPORT

The roll of permanent members, as published in my report last year, shows 884 names. Forty-seven members were elected at the Columbus meeting. Since that time there have been reported the following deaths: Dr Wm. Dennis, Burbank; Dr M. V. Hardy, Marietta; Dr J. D. Harmon, Warren; Dr C. L. Armstrong, Cincinnati; Dr J. S. Haldeman, Zanesville; Dr E. H. Hyatt, Delaware; Dr T. S. Barnes, Chillicothe; Dr H. A. Ruess, Mansfield; Dr T Stilwell, Fremont; Dr F. A. Todd, Toledo; Dr W. O. Huston, Bellaire.

The following resignations have been sent to the Secretary: Dr J. S. Lee, Akron; Dr F. C. Curry, Milford; Dr J. C. Hardy, Marietta; Dr J. L. Williams, Indianapolis; Dr W. A. Carmichael, Loveland. The deduction of these sixteen names leaves 915 names on the roll of permanent members. One member, who had been dropped from the Treasurer's list for non-payment of dues, has paid his back dues and been reinstated. This calls attention to the fact that there is no provision in our Constitution or By-laws for the management of such cases. In some instances the delinquent

members have applied for admission and their names have been acted upon by the Committee on Admissions and reported to the society. In other cases, where the men were known to be in good standing in the profession, the Treasurer and Secretary have restored them to the roll without any formal action by the Society. Some definite method of handling these cases ought to be incorporated in the By-laws by an amendment, at this meeting.

The Secretaries of the Auxiliary Societies have reported this year with unusual promptness. Only one Society is known to be defunct, that of Fayette county. Some other county societies have been practically incorporated into district associations but they still maintain their organization.

The work of the Secretary has been presented to you partly in his portion of the transactions, that all members have received, and partly in the program prepared for this meeting. With the printed evidence before you, to show whether his work has been well or poorly done, further details in this report are unnecessary.

The report of the Committee on Publication was read by the Secretary and on motion the action taken by the Committee was approved.

REPORT OF THE COMMITTEE ON PUBLICATION

The Publication Committee met May 10, 1899 and, in the absence of the Chairman, organized by the election of Dr Foshay as Secretary and Chairman *pro tem.*

Bids for printing the proceedings of 1899 were opened and the contract awarded to J. B. Savage of Cleveland, the lowest bidder.

On motion Dr Foshay was reelected Editor.

On motion the Editor was allowed the usual compensation—$100—and expenses.

The Committee on Growth and Prosperity reported through Chairman W. H. Humiston as follows:

"I have to report in behalf of my committee that we have used every endeavor during the past year to add to the membership of the Ohio State Medical Society, and we have sent communications to all members of the profession in the State urging them to become members. We have had 75 new members join us this year, 47 of them at the present session. We hope to take this work and push it so that every physician in the State will be a member of the Ohio State Medical Society."

The Committees on Legislation and Ethics were called but had no business to report.

The report of the Committee on National Legislation was read by Dr L. B. Tuckerman.

REPORT OF THE COMMITTEE ON NATIONAL LEGISLATION

During the past year no action has been taken by Congress upon any of the measures regarding which this Society petitioned Congress at its last meeting. Hon. T. E. Burton, in the House, has endeavored to secure some action on the measure providing for efficient sanitary inspection of immigrants and their baggage at ports of embarkation, but has so far been unable to bring the bill to a vote. Neither has Senator Gallinger been able to bring to a vote his antivivisection bill (S. 1063), against which bill this Society entered its earnest protest. Your committee corresponded with both Senators from Ohio, notifying them of the action and wishes of this Society. Hon. M. A. Hanna responded as follows:

Washington, D. C., Jan. 18, 1899.

Dr L. B. Tuckerman, 298 Central Ave., Cleveland, O.: My Dear Sir: Your favor enclosing the resolutions of your Society in reference to Senate Bill No. 1063 has been received. I note your request and will give it consideration when the bill comes up. Truly yours, M. A. HANNA.

Hon. J. B. Foraker responded as follows, per secretary:

Washington, D. C., Jan. 18, 1899.

Dr L. B. Tuckerman, 298 Central Ave., Cleveland, O.: Dear Sir: Senator Foraker directs me to acknowledge the receipt of your letter of the 15th inst., and to say that he does not think the bill referred to will come up for consideration at this session. The time is so short now that bills of greater importance must be considered, and they will no doubt take up all the time till the 4th of March, when Congress must adjourn. Very truly yours, etc.,

S. C. SCHENEWETH.

With regard to the overture of the Ohio State Medical Society to the American Medical Association respecting the organization of a permanent committee on national legislation, the American Medical Association took no action, the committee to whom the matter was referred deeming it best to hold it over for more mature consideration. The Gallinger bill is therefore still pending, the measure to properly inspect immigrants is still hanging fire, and the medical profession is still without any organ by which the consensus of medical opinion, as represented in the great medical organizations of the United States, can be brought to bear effectively upon Congress in relation to those matters wherein we as a profession are deeply interested, and whereof we are able to speak with authority and ought to be listened to with respect.

Your committee would therefore recommend that we reiterate our protest against the Gallinger bill and our action in favor of more thorough medical inspection of immigrants, by the adoption of the following resolutions:

Resolved, That we again enter our earnest protest against Senate Bill No 1063, entitled "A Bill for the Further Prevention of Cruelty to Animals in the District of Columbia," for the reason that existing laws amply provide for the

prevention and punishment of any real cruelty to animals which may be proven to occur within the District, and because the physicians and scientists of the District have not so conducted themselves in the past as to warrant the system of irresponsible espionage authorized by the bill, and further, because the paramount interest of the sick and the afflicted demands that the medical profession shall have liberty to investigate the nature and treatment of disease, free from cumbersome and vexatious restrictions, such as are provided in the measure in question.

2. That we again urge upon Congress the necessity of thorough inspection by a medical officer of the United States, of all immigrants and their baggage, before they embark for this country, in order that the importation of contagious and infectious filth-diseases may be more effectually prevented.

3. That the Secretary of this Society send a copy of these resolutions to each Senator and Representative in Congress from Ohio, and of the latter resolutions to the chairman of the committees on commerce and on immigration of both House and Senate.

And it is further recommended that we again urge upon the American Medical Association the pressing need of the organization of a National Committee on Legislation, and ask that favorable consideration be given the plan of organization proposed last year by this Society, *viz*:

1. That the American Medical Association appoint a standing committee of three on national legislation; one member to be a resident of Washington, one of Baltimore, and one of Philadelphia—a committee so located that it could be called together at Washington on short notice and appear before the committees of Congress at any time.

2. That each State Society of legally qualified practicians of medicine be requested to appoint a committee of one on national legislation; such committee to keep himself

in communication with the Senators and Representatives from his own State, so that they may be always kept in touch with the medical profession concerning matters of sanitary and medical legislation.

3. That a joint meeting of the Committees of the American Medical Association, and of the committeemen of the several States be held in Washington, subject to the call of the Committee of the American Medical Association. The purpose of that meeting would be to give opportunity for each State committeeman to personally interview the Representatives and Senators from his own State, and for the committee as a whole, or by subcommittees, to appear before the various Congressional committees to set before them authoritatively the sentiment of the medical profession regarding pending legislation, and to urge the passage of measures upon which the medical profession of the nation has already agreed, and to which it has already given support by formal action.

4. That the necessary expenses of such committeemen be borne by their respective societies.

It was moved by Dr W. H. Humiston that the resolutions submitted by the Committee on National Legislation be adopted. Carried.

The report of the Committee on disinfection of Public conveyances was read and referred to the Committee for further action.

The report of the State Board of Medical Registration and Examination was read by Dr S. B. McGavran.

REPORT OF STATE BOARD OF MEDICAL REGISTRATION AND EXAMINATION

I have the honor to present you with a brief report of the proceedings of the Ohio State Board of Medical Registration and Examination for the past year.

There have been issued to graduates in medicine 790 certificates; legal practicians, 14; by examination, 1; total number, 806.

To midwives there have been issued by the probate judges of the several counties, 6; by examination, 6; total 12.

The number of applications rejected during the above period has been, graduates, 17; legal practicians, 11; on examination, 2; total number, 30.

The total number of certificates issued since the passage of the law is to graduates, 8,311; to legal practicians, 711; on examination, 14; total, 9,036.

The total number of midwives given certificates since the passage of the law by probate judge, 287; by examination, 16; total, 303.

Rejections, graduates, 138; legal practicians, 215; on examination, 16; total, 369.

The number of prosecutions during the past year were 72; of these 59 were charged with illegal practice of medicine; 13 were charged with the illegal practice of midwifery.

In addition to applicants rejected and compelled to discontinue the practice of medicine by prosecution, a large number have been forced to comply with the law by notice sent to them by our very efficient Secretary, Dr Frank Winders, demanding the violator of the law to immediately discontinue. In at least two-thirds of the cases this demand is complied with and our purpose is accomplished without the expense of prosecution.

Instances of illegal practice of medicine are not one-third as frequent as they were one year ago, and while we know that there are many men who are legally practicing medicine in the State of Ohio, whom we believe to be totally unqualified for the practice of medicine, yet this is not the fault of the State Board, but wholly the fault of the law governing the Board. The conditions have been such that dur-

ing the past year we have had but few cases prosecuted in which the defendant openly violates the law by the actual practice of medicine in the sense of a physician. In a great majority of cases in which the complaints are made the defendants are Christian Scientists, Osteopaths, Medicine Vendors, so-called Opticians, Cancer Doctors, Magnetic Healers, and a class of persons who attempt to violate the medical law by selling a remedy with a stated price upon the bottle or package. In a great majority of cases these people call themselves "Doctors," which, of course, is not a violation of the law, since they do not use M. D. or M. B. They canvas from house to house and when tney find a sick person make a sort of examination, prescribe their remedy and sell it for a stated price, which is marked upon the bottle, claiming they did not prescribe for a fee, and it being necessary for us to prove a fee before we can prove a violation of the law, we are unable in a great many instances to convict in such cases. The osteopath case is in the Supreme Court; briefs have been printed and filed and the case only awaits assignment for oral argument.

Another great obstruction to the proper enforcement of the law is, the Board will secure evidence against a party for violating the medical law and file an affidavit before a justice of the peace. The defendant waives examination and is bound over to the grand jury. When the grand jury meets, the case is brought before it and the evidence is of the strongest character, proving without a doubt that the defendant has violated the medical law, and yet, because of sympathy with the defendant, or belief on tne part of the grand jury that the medical law is a sort of a doctor's trust for the purpose of controlling the practice of medicine, the grand jury refuse absolutely to make an indictment. Another condition which has operated to defeat to a very great extent the purpose of our law, is that of remission of fines by the trial judge after the case has been convicted. In sixteen cases brought during the past year the fines were

remitted by the judge. I desire to emphasize the recommendations previously made by Dr Coleman.

First, that the law be so amended that a justice of the peace be given final jurisdiction in all cases insofar as relates to the facts.

Second, that the law be made plain in the matter of remission of fines, and that it state plainly that fines once assessed cannot be remitted by the trial judge.

The Board recognized 153 medical colleges in the United States and 7 in Canada, as being in good standing. It has been the unanimous desire on the part of the Board and its executive officers that the law relating to medical colleges and the rules adopted by the Board governing the same be faithfully executed. In this we have had the hearty assistance and co-operation of the medical colleges of Ohio, and they have not only shown a willingness to comply with the rules of the Board as to entrance qualifications and final examinations, but they have increased their equipments so that it can be truthfully said that the medical colleges of Ohio are on an average of 50% better than three years ago.

During the past year good work has been accomplished in the following instances:

First, the successful prosecution of more than 50 illegal practicians of medicine.

Second, after many difficulties, success in getting the questions of Christian Science and Osteopathy before the Supreme Court for final decision.

Third, the adoption of the following rule which has gone far toward the prevention of short-term graduations: "Resolved, That after October 4, 1898, no medical college or university will be recognized as in good standing by this Board which will graduate in one term students who have attended but two terms of a four years' course, and applicants presenting such credentials will not be entitled to registration in Ohio."

Fourth, the raising the standard of the medical col-

leges of Ohio as well as those located outside of the State by refusing to register their graduates unless the college complies with the rules of the Board.

Fifth, the securing of two strong Supreme Court decisions in the past year in the cases of the State of Ohio against Hale, and Eberts against the State Board of Medical Registration and Examination. In the former case the criminal pleading under the act of February 27, 1896, has been simplified and facts coming within the knowledge of the defendant charged need not be averred negatively as in common criminal practice, and the several parts of the law and its provisos, with the power of the Board, have been enlarged upon and construed in its several relations and parts. In the latter case it was found that the practice of the Board of issuing certificates to practising physicians upon ten years' practice has been wrong, the Court there holding that to entitle a physician to a certificate upon ten years' practice for ten years prior to May 5, 1868, and not prior to February 27, 1896.

The conditions of the State of Ohio outside of the larger cities of Cleveland and Cincinnati and excepting the Osteopath and Christian Science cases are about as good as ever can be under the present law. It now remains for the Ohio State Medical Society to place itself squarely and earnestly in favor of changing the law so as to give the Board power to examine each individual applicant and not depend upon his graduation from a reputable medical college. When such an organization as the Ohio State Medical Society places itself on record in favor of an examining board it means more than "something," it means much. It indicates that this learned and conservative body has been forced to the conclusion that the present law is not sufficient to protect the laymen from incompetent and ignorant practicians."

It was moved by Dr L. B. Tuckerman that the report be received and adopted. Motion was carried.

Dr N. P. Dandridge presented the following resolutions:

"Whereas, the physicians in Ohio have now all been registered and legally licensed to practice medicine in the State,

And whereas, the present law does not sufficiently protect the citizens of the State from the influx of unqualified physicians who may desire to settle in Ohio,

Therefore be it resolved, That in the judgment of the Ohio State Medical Society the time has come when the welfare of the community demands that the present law be so amended, that in the future all persons desiring a license to practice medicine in Ohio shall be required to pass an examination by a State Board of Examiners, after having first received a diploma from a medical college in good standing, that requires four years of study.

Resolved, that the next legislature be petitioned in the name of the Society to amend the present law.

That the Board of Medical Registration and Examination shall be known as the Ohio State Board of Medical Examiners and that all applicants for a license to practice in the State be required to pass a satisfactory examination before this Board—it being provided that only those are eligible for examination who have already received a diploma from a college—either within or without the State—that is in good standing and that requires a four years' course before graduation.

And further be it resolved, that the President of this Society be instructed to appoint a committee of three to assist in drafting a proper amendment to the law, and to endeavor to secure its passage by the Legislature."

In support of these resolutions Dr Dandridge offered the following remarks:

"In support of these resolutions I desire to say that the registration of the entire state is now practically complete. The shortcomings of the present law were foreseen from the

very beginning, and it was fully appreciated that a time would come when a step further would have to be taken to place us in line with those states about us that already require examinations. There are now some thirty states in the Union which require an examination, and applicants coming before these various State Boards that are rejected can come into Ohio, and present their diplomas from the colleges from which they have graduated and the present Board is bound to issue a certificate in case the college is in good standing. That this has acted deleteriously to this state is very well known by the statistics of the present Board. From January 10, 1897, to January 1, 1898, there were issued to graduates 696 certificates. Of these 270 graduated from colleges not in this State, 426 were graduates of Ohio colleges so that in that year about two-fifths of all the men to receive certificates to entitle them to practice medicine came from without the State. From January 1, 1898, to January 1, 1899, there were 790 certificates issued, and 227 of this number graduated from colleges not in Ohio, and 563 from Ohio schools, the proportion being a little less than in the previous year.

In looking over a list of the colleges a large proportion of them are found to be institutions which are not well known. They have a standing however which entitles them to be classed as colleges in good standing. In the present condition of affairs students who have been rejected in other States can come in and register their diplomas and receive a license to practice. It is very desirable I think that Ohio should place herself in line with those States which require examinations. I think it particularly important that we should not follow the State of Illinois and exclude our own colleges from this examination; we should all be on the same footing. For these reasons I have offered these resolutions, and I now move you their adoption."

Seconded by Dr Chapman as follows:—"Recognizing the great need along this line and the necessity for the

adoption of some measure to regulate the abuses spoken of, I second this motion." The resolutions presented by Dr Dandridge were adopted.

President Coleman appointed as the special committee on the amendment to the medical practice act, provided for in the resolutions of Dr Dandridge, Drs N. P. Dandridge, C. F. Clark and L. B. Tuckerman.

Dr N. Stone Scott offered resolutions that no professor or teacher in any medical college, nor any graduate of any medical college in the United States, which shall after July 1, 1899, confer the degree of Doctor of Medicine, or receive such degree on any condition below the published standard of the Association of the American Medical Colleges, be allowed to register either as a delegate or permanent member of this Association. The point of order was made by Dr J. C. Oliver that the resolutions as presented were not offered as an amendment to the Constitution or By-laws and that they prescribed new qualifications for membership and hence were unconstitutional. The President decided the point well taken and the resolutions not in order.

The election of officers being next in order, nominations for President were called for. Dr C. A. L. Reed said:

"A year ago at Columbus, it was my great pleasure to place your name, Mr. President, in nomination for President of this Society, the chair you have so gracefully and efficiently occupied for the past year. That duty was not only a duty but a pleasure. But it was a pleasure that was marred only by the circumstance that in urging your candidacy it implied an incidental opposition to the candidacy of my friend and neighbor who had been most favorably and enthusiastically mentioned in connection with this office. Today it is my pleasure to present to the Society the claims of this gentleman. You all know him very well. For twenty years or more he has graced the membership of this Society and adorned its deliberations. His earnest work

in the rank and file of the profession, and the marked skill he has exhibited in his chosen specialty have been of such a nature as to command your admiration and support. Today I take pleasure in presenting him to this Society that he may become the recipient of your kindest suffrages and by your favor be inducted into the Presidency of this Society. I take pleasure in placing in nomination the name of Dr Rufus B. Hall of Cincinnati."

There being no further nominations, Dr J. C. Oliver moved that the Secretary be instructed to cast the ballot for Dr Hall as President. Seconded and carried.

The report of the Committee on Nominations was read by Dr Foshay.

1st Vice-President, John H. Rodgers, Springfield.

2d Vice-President, C. E. Beardsley, Ottawa.

3d Vice-President, D. C. Wilson, Ironton.

4th Vice-President, S. B. McGavran, Cadiz.

Secretary, John A. Thompson, Cincinnati.

Assistant Secretary, left open for decision as to place of meeting. [See page 36.]

Treasurer, James A. Duncan, Toledo.

Committee on Finance, W. J. Conklin, Dayton; Ethics, D. R. Silver, Sidney; Publication, J. P. Sawyer, Cleveland; Legislation, N. P. Dandridge, Cincinnati; Admissions and Medical Societies, Frank Winders, Columbus; Growth and Prosperity, W. C. Chapman, Toledo; and Special Committee on National Medical Legislation, L. B. Tuckerman, Cleveland.

On motion the report of the committee was adopted and the Secretary instructed to cast the ballot electing the officers named.

The Finance Committee reported that they had examined the accounts and vouchers of the Treasurer and found the same to be correct.

On invitation of Dr Starling Loving the Society decided to meet in 1900 in the city of Columbus.

Dr W. C. Chapman spoke of the Centennial Celebration to be held in the city of Toledo in 1902, the citizens of that city making great efforts to have as many organizations meet in Toledo in that year as possible. While the motion was a little irregular, he would move that the Society select Toledo as the place of meeting for 1902. Motion seconded and carried.

The Committee on Admissions made a partial report and the names of the applicants favorably acted on were elected to permanent membership.

Dr Starling Loving requested that a paper, "The Treatment of Epidemic Influenza or La Grippe," be read by title and referred to the editor for publication, and the request was granted.

President Coleman appointed as a special Legislative Committee for the prevention of contamination of dairy products Drs L. B. Tuckerman, J. H. Sharp, and C. F. Clark.

On motion the Secretary was authorized to issue delegate certificates to members in good standing who wished to attend the meeting of the American Medical Association.

President Coleman then delivered the annual presidential address.

Dr W. C. Chapman moved that the President-elect, Secretary-elect and Chairman of the Committee on Arrangements be authorized to select the date of the next meeting. This motion was carried.

Dr Baldwin moved that the part of the President's address referring to malpractice suits be referred to the Committee on Legislation to present to the Legislature. Dr F. F. Lawrence moved to amend by referring it to a special committee. The amendment was carried and the motion as adopted was that that part of the President's address which referred to suits for malpractice be referred to a special committee and that that committee be authorized to in-

crease its membership, as it may see fit, for the purpose of securing needed legislation in this direction. The Chair appointed Drs P. S. Conner, J. F. Baldwin and L. B. Tuckerman as this committee.

A paper, "Medical Jurisprudence with Needed Legislation," was read by Dr David O. Brine of Urbana.

The annual address on Medicine was then delivered by Dr John V. Shoemaker of Philadelphia.

The committee on the disinfection of public conveyances reported as follows:

"Whereas, it is now recognized by the profession that public conveyances, such as railway coaches, street-cars and hacks may become contaminated from the expectoration of tuberculous matter, the transportation of dead bodies, and the conveyance of convalescent patients suffering from diphtheria, scarlet-fever, measles, whooping-cough and other contagious diseases, thus becoming a prolific source of disease and a menace to public health. Therefore,

"Be it resolved: That it is the sense of the members of the Ohio State Medical Society that the State Board of Health should look into the matter of contamination of said public conveyances, both as to the prevention of the same and as to the proper means of disinfection." On motion the report was adopted.

Dr Ben Davis of New Carlisle moved that Dr Shoemaker be elected as honorary member. The motion was carried.

An amendment to the law fixing the compensation of physicians for services to paupers was offered for the approval of the Society by Dr A. H. McCullough of Mansfield. It was referred to the executive committee.

A paper, "Observations on the Surgery of the Neck, based on Clinical and Experimental Evidence," was read by Dr George W. Crile. It was discussed by Drs L. B. Tuckerman, J. F. Baldwin, C. F. Clark and the essayist.

A paper, "Traumatic Cataract," was read by Dr C. F. Clark, and discussed by Dr J. S. Carlton.

An instrument for washing out the pelvis of the kidney was shown by Dr L. B. Tuckerman.

The Society then adjourned until 8 P. M.

EVENING SESSION

The Society was called to order at 8 P. M. by Dr G. A. Collamore, Vice-President.

An address, "The Medical and Surgical Lessons of the Late War," was then delivered by Dr P. S. Conner.

On motion the thanks of the Society were presented to Dr Conner for his address. The Society then adjourned to the Annual Banquet at the Arcade Hotel.

FRIDAY MORNING, MAY 12

The Society was called to order by President Coleman at 9 A. M. The minutes of the previous session were read and approved.

On motion of Dr J. F. Baldwin, Dr H. M. Platter of Columbus was elected Assistant Secretary.

The request of Dr J. U. Barnhill to have his paper read by title and referred to the editor, was granted. The Society then divided into medical and surgical sections.

SURGICAL SECTION

Dr F. C. Larimore of Mt. Vernon was elected chairman of the surgical section.

A paper, "Some Practical Points in the Diseases of Women," was read by Dr Wm. H. Humiston of Cleveland.

A paper, "Some Unusual Cases of Sarcoma of the

Kidney, with a Point in Differential Diagnosis," was read by Dr J. F. Baldwin of Columbus, and discussed by Drs W. J. Means, C. A. Hamann and the essayist.

A paper, "The Practical Application of the X-Rays in Surgery," was read by Wm. J. Taylor of Cincinnati. This paper was discussed by Drs W. J. Means, R. B. Hall, J. F. Baldwin, F. C. Larimore and the essayist.

A paper, "Cases of Obstipation Radically Treated," was read by Dr Thos. C. Martin of Cleveland.

A paper, "Treatment of Fractures of the Patella," was read by Dr W. J. Means of Columbus. This paper was discussed by Drs C. A. Hamann, J. F. Baldwin and the essayist.

A paper, "Edema and Elephantiasis of the External Genitalia, Following Removal of the Inguinal Glands," was read by Dr C. A. Hamann of Cleveland.

A paper, "The Iris in the Operation of Cataract Extraction," was read by Dr J. E. Brown of Columbus.

The Section then adjourned.

MEDICAL SECTION

A paper, "How the General Practician Can Aid in the Advancement of Psychiatry," was read by Dr E. G. Carpenter of Columbus.

A paper, "The Symptomatic Treatment of Consumption," was read by Dr B. F. Lyle of Cincinnati. This paper was discussed by Drs L. B. Tuckerman and J. A. Thompson and the discussion closed by Dr Lyle.

A paper, 'Digitalis and the Heart," was read by Dr G. M. Waters of Columbus.

A paper, "The Ocular and Orbital Manifestations of Lesions of the Frontal Sinus," was read by Dr Robert Sattler of Cincinnati.

Dr J. C. Culbertson moved that the papers of those

members who were unavoidably absent be read by title and referred to the Editor for publication. This motion was carried.

A motion, "Resolved that the Ohio State Medical Society tender the Committee of Arrangements their sincerest thanks for the efficiency, untiring courtesy and self-sacrificing devotion that have made the Fifty-fourth Annual Meeting a continual pleasure to those members fortunate enough to enjoy their hospitality," was offered by Dr Jos. A. Hall. This motion was carried by a rising vote. Dr H. H. Seys responded in a brief address, saying how much pleasure it had given the local profession to entertain the Society.

The minutes of the session were read and approved.

In putting the motion for adjournment *sine die* President Coleman said:

"I am profoundly thankful for the very efficient aid you have rendered in the discharge of the duties of this office and the courtesies you have shown me at all times. To the local members of the profession, especially the Committee of Arrangements, our thanks are especially due for their untiring efforts to make our visit pleasant and profitable. It only remains for me to declare the Fifty-fourth session of the Ohio Medical Society adjourned to meet in Columbus, Ohio, in 1900, without day."

Chapter II—Addresses

PRESIDENT'S ADDRESS

RELATION OF MEDICINE TO STATE

BY N. R. COLEMAN, M. D., COLUMBUS

At the close of the nineteenth century the medical profession has arrived at one of the most active stages of progress in its entire history. Since the discovery of the causal relation of bacteria to disease much of pathology has been revolutionized, and with it many forms of treatment for medical and surgical cases. The mechanical and physical resources available for research, diagnosis and treatment add scientific accuracy to observation. Chemical discoveries throw new light upon physiologic processes and multiply therapeutic agents. Within the profession are being fostered and developed various specialties, having organizations to stimulate investigation in their own domains; and achieving results which arouse our admiration and enthusiasm. Public laboratories and special facilities for original research have been established, and in some cases endowed by medical men. But the activities of progress are not confined to internal developments alone. We find emanating from the profession the enactment of laws for the protection of the public against the ravages of disease; and for the care and amelioration of the afflicted. Such laws provide for elevating the standard of medical education, for establishing agencies to enforce sanitation and quarantine, for the prevention of the adulteration of food and drink, and for the care of the insane, feeble-minded and epileptic.

It has frequently occurred to the writer that the general public failed to comprehend the high motives of physicians

in the actions above enumerated; that it was for the good of the great commonwealth and not from purely selfish motives that they were instituted. This address therefore will be concerned with some of the relations of medicine to state, and especially with the relations of the medical profession to our own commonwealth. First then it will be necessary to briefly enumerate the various laws that have been framed for the protection of the people of this state, and for affording to them a surer relief from suffering and affliction; for it is clearly evident, even upon casual observation, that these laws advocated by the medical profession have always tended to the elevation and betterment of the general public.

In 1893 Dr Dudley P. Allen, then President of this Society, gave in his address the history of the Medical Convention and the Medical Society in such a comprehensive manner that to dwell further upon the subject would be uncalled for.

The earliest legislative action pertaining to medicine called into existence the Medical Convention, and from 1811 to 1846 this body is so involved with the various legal enactments that their enumeration is an outline of the history of that organization. We find that the first law having in view the regulation of the practice of medicine was passed January 14, 1811. This law remained in force until February 8, 1812 at which time it was repealed. The act of February 8, 1812, was repealed by an act passed January 14, 1813, entitled "An act to Regulate the Practice of Physic and Surgery," which substantially reenacted the law of 1811. The act of 1813 was repealed by another passed January 28, 1817. This act was amended in 1818, and both act and amendment were superseded by an act passed January 15, 1821. Again we find the act of 1821 repealed by an act passed February 26, 1824. This act continued in force without material modifications until February 25, 1833, when it was repealed. After its repeal no other law was enacted

until May 5, 1868, which was the last law passed under the old constitution to regulate the practice of medicine in this state, and leaving a period of thirty-five years in which there was no law whatever to regulate the practice of medicine, to require professional qualifications, or to reject or obstruct anyone who might desire to call himself a physician.

It is worthy of note that during this period, from 1833 to 1868, some of the most destructive epidemics prevailed that have ever been known in the history of the state, including the great epidemics of cholera in 1848, '49, '54, '66 and '67. The first three of these history gives as very severe, costing thousands of lives and carrying consternation and death into every portion of the state. In 1857 and '58 diphtheria raged with disastrous results, in some cases sweeping away whole families and desolating villages. It was apparently beyond control by any method known to the profession at that date, and from the descriptions that have been given at various times of its resistless and destructive progress, physicians must have been ready to exclaim in the language of the Psalmist, "As for man his days are as grass; as a flower of the field so he flourisheth. For the wind passeth over it and it is gone."

Typhoid fever prevailed probably to a greater extent during this period than ever before or since. In evidence that the physicians were not qualified as they should have been, is the fact that the fever carried with it a name the same as that of the family in which it appeared; and thus it was that within a single county the same fever prevailed with a dozen or more names. Scarlet-fever at that time was more dreaded than any disease afflicting children; and when it started in a section of country it traveled steadily for weeks, and in some cases for months, without being restrained. It is scarcely a matter of surprise to know that disease at that period should pursue such an extremely malignant course, as the majority of the physicians were illy educated and poorly supplied with libraries or the

resources necessary to combat disease. Such things as quarantine, isolation and disinfection were not observed. During epidemics, people were allowed to commingle, and to attend churches, funerals and schools without restriction. No intelligent person can imagine such a condition prevailing at the present day; and yet there are those who will persist in saying "No progress is being made." Is this said in malice or in ignorance?

After a mental sleep of thirty-five years we find the general assembly aroused, and on May 6, 1868, it enacted a law to regulate the practice of medicine, entitled "To Protect the Citizens of Ohio from Empiricism and Elevate the Standard of the Profession." This act took effect October 1, 1868, and was the first law that really specified in any distinct form the qualifications of those who should engage in the practice of medicine in the state. The law was amended in 1880, and thereby very materially weakened. By another amendment in 1885 it was rendered practically a dead letter. The law, as it stood in 1868, was observed to a certain extent, and exerted a wholesome influence over the profession of the state. It gave them hope, and stimulated them to united action. Its provisions allowed only those who had been continuously in practice for ten years, or were graduates in medicine, to continue their business; with a further provision that those who had been in practice five years were allowed two years in which to gain a diploma. This shows that a sentiment was gaining ground, which demanded the protection of the people. Medical organizations took on new life, and professional progress was noticed on every hand. Notwithstanding the blow that the law received in 1880, it was not until the decision of the Supreme Court at the January term, 1881, that the law received its death-blow. The decision which came from that august body, in the case of Wert vs. Clutter, was that ten years of practice *after* the passage of the law was equivalent to ten years of practice *preceding* it. Or, in other words, if a man should

go on and violate the law for ten years his acts then became legalized. Let it be said to the honor of that body that the decision was not unanimous, there being three judges in the affirmative and two in the negative. It is exceedingly gratifying to learn that the present Supreme Court of Ohio, composed of six members recruited from the leaders of the Ohio Bar, and whose reputation for legal attainments is not confined to the limits of this State, did, on March 14, 1899, in the case of Eberts vs. The Ohio State Board of Medical Registration and Examination, render a decision practically reversing the opinion of the majority in the case of Wert vs. Clutter, and following the dissenting opinion of the minority, as reported in that case.

Our physicians however did not give up hope of proper legislation, but continued their efforts year after year, meeting with disappointment and even abuse, until finally those efforts were crowned with success on January 27, 1896. The law in force at the present time is not perfect. Few laws are when first enacted. They must be shaped and fitted to the conditions which arise from their enforcement. Nevertheless I confidently believe that there is no fair-minded intelligent citizen within the state but will admit that the law thus far has accomplshed a great good. It may not be so apparent to casual observers, and particularly to those inclined to take an extreme view of everything. If such will be a little patient, I am sure that the law will demonstrate its benefits to the commonwealth and will bear ripe fruit.

As has been stated, the law is not a perfect one, but we must remember that when the law was first framed the question was not alone what we might desire, but what we could then obtain. Furthermore our present laws are much the same as those enacted primarily by many other states in the union. By means of a registration law, those empowered can determine who were legally practicing in the state under former laws, and by careful scrutiny can

weed out many flagrant offenders against the public weal. But there is another and more insidious danger against which the registration law does not protect the public. It has been established by the experience of other states, and beyond all question, that a *diploma standard* alone is not a safe guide to judge of the qualifications of the physician, for the granting of such diploma is left to an *interested* and in some cases *indulgent faculty;* and just as long as these conditions obtain will *doubt, perplexity,* and *unreliability* prevail.

Having duly appreciated these questions, some thirty states and the District of Columbia have enacted laws requiring all persons entering upon the practice of medicine in such states not only to be graduates of medical colleges in good standing, but also to pass an examination before their state boards. While the operation of such laws exerts a most salutary influence upon the standard of qualifications in those states where they obtain, a totally different effect is had upon other states not demanding such requirements. It is evident that a large number of applicants, rejected by such state boards, enter a state having a registration law only and obtain a certificate to practice; thereby defeating the very intent of the law, which was to furnish thoroughly qualified physicians to care for the sick and injured in its communities.

With a desire to keep abreast with the advances made in the standard of medical education, your President would therefore recommend that the law of Ohio be so amended that those desiring to enter upon the practice of medicine shall be graduates of medical colleges in good standing as determined by the Board, and shall be examined by the Board to determine their scholastic attainments. Section 4403f, defining the practice of medicine, should also be amended, as it is defective, in that it is not broad and explicit enough to meet all the various plans resorted to by designing persons who impose upon the public. These

resort to various devices, in prefixing to their name Dr or Professor, or something of similar nature calculated to mislead and deceive the public.

I would further call your attention to Section 4403g, that it be so amended that fines once imposed could not subsequently be remitted by the magistrate before whom the case is tried. Still another amendment should be made, and that is to give a justice of the peace final jurisdiction *relating to facts* in prosecutions brought under Section 4403g. It is earnestly hoped that the chairman of the Executive Committee on Medical Legislation may submit amendments to the present medical law that shall be approved and supported by this body.

The men rejected in the thirty-odd states having examining laws, fill up other states with incompetent practicians, who, thus coming, bring with them many diseases afflicting the medical profession. These "diseases of the medical profession" were fully described and accurately diagnosed in an address delivered last year at Denver by Dr Leartus Connor. The first of such diseases to which I would call your attention is the infection by "moral degenerates." Many of these no doubt were born such; others debased by dissipation and association; but all become plague-spots to degrade and corrupt those who come in contact with them. Another morbid influence is that from "pure tradesmen." They have not the ability to receive either a literary or medical education, but through the negligence, sympathy, favoritism or ignorance of their teachers, have obtained their diplomas. Such individuals are arrogant and attempt to thrust themselves upon the community with an effrontery and pretense that would cause most men to blush. They are unable to diagnose diseases or to write prescriptions, and hence they become the tools of quacks, or of the men calling themselves pharmacists, who make up "polypharmaceutical monstrosities" and advertise them largely over the signatures of Dr A. and Dr B., graduates of such and such colleges.

Then, again, we have those I may call the Seven-day Specialists. Unable to face the responsibilities involving the issues of life and death, they go off to some postgraduate school, remain a few days, or possibly a few weeks, then they come into the state and upon a diploma receive a certificate. Poorly qualified in all respects, they are simply impostors. Do not judge me as speaking disparagingly of specialists, for no man has a higher regard for a specialist than myself; but a specialist and a pretender are widely different. The true specialist is the man who has had thorough training and received a general literary and medical education, who has spent considerable time in general practice and become familiar with the history and laws of disease. Such a course is essential from the fact that a large percentage of special disorders arise as the complications, prodromes or sequels of general diseases. We recognize another disease brought into the state under the present law by the presence of impostors and demagogs, who, unable to compete with the average of professional attainment, resort to sounding their own praises by bombast, public print, etc. They generally shift from place to place, as they cannot remain long ere their imperfections become manifested.

Others again may be simply incompetents. They have a fair amount of education, seem to be fairly intelligent, but when put to the test of performing practical work they are constantly making blunders, over-dosing, and in many ways unnecessarily jeopardizing the lives of their patients. Disappointed and harrassed by frequent failures, they then blaspheme medical art and all connected with it.

Other instances of these diseases afflicting the profession of the state might be mentioned, and some of them doubtless may now arise in your thoughts, but enough have been rehearsed to convince you that at least neither wealth, comfort, or strength can accrue to the state from the presence of citizens recruited from these sources, and that in

the interest of good government and prosperity the advent of such should have legal restrictions.

THE LAW TO ENCOURAGE THE STUDY OF ANATOMY IN THE STATE OF OHIO

Was enacted March 25, 1870, amended February 19, 1881, and further amended April 5, 1898. It might not seem inappropriate to call attention to some of its provisions, which may be of interest to physicians other than those connected with medical colleges. Superintendents, trustees, or directors of all city, county and state public charitable institutions, supported in whole or in part by public expense, "township trustees, sheriffs, or coroners, in possession of bodies not claimed or identified, or which must be buried at the expense of the county or township, shall, before burial, hold such bodies not less than thirty-six hours and shall notify the professor of anatomy in any college which by its charter is empowered to teach anatomy, or the president of any county medical society, of the fact that such bodies are being held, and shall, before or after burial, by such said superintendent, director, or other officer, on the written application of the professor of anatomy, the president of any county medical society, deliver to such said professor or president, for the purpose of medical or surgical study or dissection, the body of any person who has died in either of said institutions from disease, not infectious, if such body has not been requested for interment by any person at his own expense." "In all cases it shall be the duty of the officer having such bodies under his control to notify, or cause to be notified, in writing, the relatives or friends of such deceased person, and any superintendent, coroner, or infirmary director, sheriff or township trustee failing or refusing to deliver such bodies when applied for, as herein provided, or who shall charge, receive or accept money or other valuable consideration for the same, shall be fined in any sum not exceeding one hundred dollars and

not less than twenty-five dollars, or be imprisoned in the county jail not exceeding six months."

The amendment made to the law April 5, 1898, cured a very serious defect; as previous to that the law was not mandatory, and therefore individuals having in charge such bodies could do as they pleased relative to delivering them to the parties authorized by law to receive them. It is probable that in the past there were very few bodies delivered to medical colleges or societies from township trustees, as I think an investigation would show that almost throughout the state they were buried at public expense. But now the law says that they shall hold them thirty-six hours and notify the president of a county medical society, or the professor of anatomy of a medical college, that they have such bodies in their possession; and with this provision the law seems about as perfect as it possibly could be, and should furnish ample material for all anatomic and surgical purposes within the limits of the state, for the law further provides that no bodies, to be used for such purposes, shall be shipped out of the state.

Permit me to suggest that county medical societies make provision for the reception and proper care of bodies falling within the purview of this act. Under the present effective method of embalming, bodies can be preserved in good condition and utilized for surgical demonstration or dissection by members of such societies, or, if not required, be thence transferred to medical schools to enhance the attainment of professional acquirements. The advantages to the people of the state from this law might not at first thought be very apparent; but at the time the law was amended, in 1881, there was much mental suffering, caused largely by sensational reports relative to the procurement of bodies that had been interred. Yet, strange to say, the amendment to the law was most bitterly opposed; and seemingly by those who could give no good reason for their action. In a very short time after its passage however all

agitation of the matter subsided, and today there is probably no one in the state who desires to see the law repealed. Not only has it proved a benefit by its tranquilizing effects, but also a direct saving to the state by taking charge of bodies that otherwise must be buried at public expense; but a greater advantage is that it affords opportunity to students and medical men to receive the necessary knowledge of anatomy, which is so essential to success not only in surgery but in medicine as well.

THE NECESSITY OF A CHANGE IN THE LAW RELATIVE TO MALPRACTICE,

from the frequency with which cases of malpractice have been and are now being brought against physicians in Ohio, would seem to demand serious attention. Such suits are brought in the majority of instances by irresponsible persons, and without a true ground for action; seriously damaging both professionally and financially the physician against whom they are filed, and in many cases assailing his private character. Let it be said to the honor and credit of the courts that they have learned to understand the motive underlying most of these actions and to treat them accordingly. Many physicians have been greatly inconvenienced by such proceedings and the fear of the same, and have felt themselves necessitated, in order to protect their families, to place their property in the hands of other persons. All the law that relates to malpractice specifically, is found in Section 4983 of the Ohio Revised Statutes, under the chapter of laws specifying limitation of action. This section was amended May 18, 1894, so as to include malpractice, and reads as follows: "An action for libel, slander, assault and battery, malicious prosecution, false imprisonment, or *malpractice*, shall be commenced within one year from the time of right of action accrued." It might not be out of place to call attention briefly to one or two decisions by the supreme court, which declare the following principles of

law pertaining to suits in malpractice: In the case of Griddle vs. Rush *et al*, 7th Ohio State Laws, second part, page 123, the Court says in effect, "That a physician or surgeon engages the ordinary skill of his profession, and diligence and care in subsequent treatment, and to use his exertion to endeavor to cure, and that the law raises no absolute undertaking to cure." Another decision by the supreme court is found in the 17th Ohio State Reports, page 253, in the case of Craig vs. Chambers *et al*, this case being an action against a surgeon for malpractice. The Court says: "the implied liability of a surgeon retained to treat a case professionally extends no further in the absence of a special agreement than that he will indemnify his patient against any injurious consequences resulting from his want of proper degree of skill, care, or diligence in the execution of his employment. And in an action against the surgeon for malpractice the plaintiff, if he shows no injury resulting from negligence or want of due skill in the defendant, will not be liable to recover nominal damages." It seems to be a well-determined principle of law that in an action for malpractice, the burden of proof is on the plaintiff to show that the injury was produced by want of skill, and such knowledge is not to be inferred.

Feeling that the physicians of the state have suffered annoyance, inconvenience and damage by having to defend themselves in malpractice suits, which in a majority of cases were unwarrantable in law, I would therefore recommend that the Ohio State Medical Society appoint a committee of three to examine the laws now upon the statute books, and determine if they can be amended to meet the proper requirements; if such is found not to be the case, then to frame a bill that will give the needed protection to the physicians of the state against malpractice, and have it introduced at the next meeting of the Legislature.

THE INSANE, FEEBLE-MINDED AND EPILEPTIC

For more than a century the medical profession has given most earnest attention to the care of the insane, and during the past fifty years it has extended its interest to the care of the feeble-minded and epileptic. Furthermore it has devoted its best talent to a more intimate study of the etiology, nature and classification, as well as to the treatment of these disorders.

To gain a more comprehensive idea of the magnitude of the work devolving upon the medical profession in directing the care and treatment of these public dependents, we must refer to a few statistics. The federal census for 1890 shows that the number of insane persons in the United States, on June 1 of that year, was 106,254; making the number of insane in each million of population 1,697. On the same date the number of persons reported as feeble-minded was 95,571; making 1,526 so affected in each million of population. The census report contains no statistics concerning the epileptic. The charitable institutions in Ohio report that on the fifteenth day of November, 1898, there were in their care 8,196 insane, 1,812 feeble-minded and 1,193 epileptic. These figures, of course, fall short of the exact number of such persons in the state, as many are cared for in private institutions and at their homes; particularly is this the case with the epileptic. As to the care of these unfortunates, all persons in our eleemosynary and penal institutions suffering from pulmonary consumption, all insane criminals, and all the criminally insane should be completely isolated from other inmates, whose lives they endanger; special provision being made to prevent all communication between them.

There should be a stringent law on the statute books of every state prohibiting the marriage of the insane, feeble-minded and epileptic, in order to prevent the propagation

of their kind. Several states, Ohio included, have endeavored to secure such legislation, but thus far have failed.

The laboratories established by the State of Ohio at the Central Hospital for the Insane, and at the Hospital for the Epileptic, will be watched by the medical profession with keen and profound interest, in the hope that through such work there may be hewn a pathway leading to clearer and more comprehensive knowledge of the etiology and nature of these mental disorders. It is possible that more might be accomplished by a single laboratory, centrally located, having sufficient equipment to pursue pathologic work for all the public charitable institutions, and conducted by men having the highest qualifications in this field of research. Such laboratories are now in operation in New York and in Indiana. The Ohio Hospital for the Epileptic is the only one of its kind supported by public funds in the United States; and the results there accomplished will be of widespread interest.

OHIO STATE BOARD OF HEALTH

A little over a half-century ago the first medical officer of health was appointed in Great Britain, and from that time on the Government Health Board has become one of the fixed departments of the kingdom, and its provisions are respected and obeyed by all.

By my request Dr C. O. Probst, secretary of the State Board of Health, has furnished me some valuable information relative to the law and its operations, and his communication reads as follows: "The State Board of Health was established in May, 1886, largely through the efforts of the State Medical Society and the State Sanitary Association. By an act of 1893 it became mandatory for all cities, villages and townships to establish boards of health. We now have 1,994 such boards organized, with members and officers numbering not fewer than 12,000 men. An organization

of health officials has been formed and an attendance of over 300 secured at the last third annual meeting." He says, "carefully prepared instructions for the prevention of various communicable diseases in various forms are furnished to the local boards, who place them in families in which such diseases appear. In addition to this work of keeping local organizations up to a point of efficiency, the State Board has given special attention to the question of public water-supplies."

"In 1893, an act was secured which required municipal and private corporations putting in water-works or sewerage, or making important changes thereof, to submit plans to, and receive the approval of the State Board of Health. Since the passage of the act the Board has passed upon 142 plans for water-works and sewerage. The Board has discouraged, and in many cases prohibited, the turning of crude sewage into streams. It has, on the other hand, encouraged in every possible way the building of sewage-disposal works; and we now have in Ohio eight cities and villages and seven public institutions where such works are in operation or are being constructed." Supplying water to the cities and towns of Ohio is one of the most grave problems that confronts the people of the state today, and requires and demands the very best thought of the medical profession and of engineers. I speak of the medical profession because there is no one so capable of knowing the necessity of strict supervision of water-supplies as the physician. It is he that always gives the first alarm of danger in a case of pollution of water, because his education and calling have taught him the danger that attends it. The water-supply problem is growing graver every year because the destruction of the forests allows the water to find its way rapidly into the channels of drainage, and, by facilitating rapid evaporation, diminishes the natural feeders of all streams, the springs. It is but a few years since, that where there were large streams of pure water that continued the

entire year, there are now small rivulets, and these dry for three or four months of the year. We find that some, even of our medium-sized rivers, cease to have flowing water during part of the summer. Into these sewage is discharged, and during the season when they are flush, all is well, and the water may become purified before it reaches the next city or town below; but when they are low, the streams become pools of sewage, there to go through all the various putrefactive changes, saturating the water with poisonous materials which make its use attended by disease and death.

There is one question that cannot be overcome by the law of any single state, and that is the control of the pollution of streams entering one state from another; and the difficulty can never be obviated until there is a national board of health that will have control of all streams within its boundaries. I learn from Dr Probst's letter that the Board is now engaged in making a very careful survey of all the rivers in the state to determine the water-sheds, and other information that is necessary, before water-works and sewerage can be constructed in an intelligent way. I also learn that the water is being carefully analyzed, by highly competent men, at various seasons of the year, all of which is commendable in the highest degree. It is safe to say that there are but few cities in the state that are furnished with absolutely pure water throughout the year. There are doubtless certain times when the water is practically pure, but at others it contains germs which produce the most serious results when taken into the system.

Doubtless the precautions now observed have had a great deal to do with the diminution of preventable diseases, and particularly typhoid; but it will be utterly impossible to stamp it out until we have some better system of supplying the population with water than we have at the present time. Every board appointed to construct water-works and sewerage systems should have as its members

at least two well-qualified physicians, as they are better prepared to understand the necessities of a good water-supply and the dangers of a bad one than any other class of persons. If we had physicians on such boards we would not hear of sewers discharging into rivers but a short distance above the water intake, and producing in our cities some of the most disastrous results.

The quality of milk supplied to a city is next in importance to that of the water, for upon it must many invalids and children subsist for days, months, and sometimes years, and the quality and purity of the milk so supplied is not controlled as directly by the board of health as the importance of the case would demand. For years the profession has been thoroughly convinced that milk has been sold containing the *bacillus typhosus*, and serious outbreaks of typhoid have been the result. In the majority of cases the contagion has been traced back to the dairyman's household, in which someone was then suffering with the disease. It would appear that there should be investigations of all dairies made at regular intervals, to ascertain not only the condition of the stock furnishing the milk, but to further determine whether any contagious or infectious diseases exist among the employees.

The system of placarding houses has been complained of, and many attempts have been made to evade the law; but the good arising from such precaution has been sufficient to educate the people to an appreciation of the great benefit and protection it entails. The thorough disinfecting of houses where contagious and infectious diseases have existed has been another safeguard thrown around the people of the state, for which they cannot be too thankful. The work of the board is in its infancy, but the good resulting from it is very apparent; so with the thorough organization which now exists, officered by men with experience—such as that of its very efficient secretary—we have no doubt of its ever-widening usefulness. The influence of the Board of

Health, like that of all other boards established for the protection of the lives and health of the general public, has been greatly restricted by inadequate appropriations, and it seems to me that the people should be constantly reminded of the importance of not stinting one of the most important departments of the state government, but to make their appropriations sufficient to establish laboratories and employ good and efficient physicians and chemists to perform the work in a scientific way. We cannot determine whether the mortality has been diminished since the organization of the state board or not, as our statistics are so wofully defective. This Society should lend its aid to any effort made to improve the registration of vital statistics.

Many benefits arising from the organized efforts of boards of health have not been appreciated in their true light. Vast tracts of land have been reclaimed and practically freed from malaria by efficient sanitary measures. Take the State of Mississippi. It was a veritable swamp; but by methods of drainage and sewerage it has become a garden spot. The civilizing and christianizing influence of sanitary laws must not be overlooked. Cleanliness and healthiness go hand in hand. Cleanliness leads to self-respect, and self-respect leads to honorable conduct.

The missionaries worked in China, in India and in Africa for many years, making but little progress and seemed to serve but little purpose except as food to satiate the cannibalistic appetites of the natives. Finally missionary physicians were sent, and the whole work was changed. The half-civilized could appreciate the relief and comfort given; it was something tangible and hence he respected it. By establishing hospitals and dispensaries, the medical missionaries became firmly established and served as a breastwork behind which religious instruction and other efforts might be performed. England was not slow to recognize the powerful influence exerted by the humanizing and beneficent efforts of medicine. Among the first institutions she

planted, when she got a footing in India, were numerous hospitals, and she proceeded to teach the natives some of the more elementary sanitary and hygienic laws.

We trust that the authorities of this government have learned by experience the necessity of sanitary measures and will put them in force in our newly acquired possessions. All the money that could have been heaped upon Santiago would not have given the inhabitants the comfort that was afforded them by the very small expenditure made under the guidance of that wise physician, soldier and statesman, General Wood; and it required but a few weeks to convince the people of the city of the usefulness of the measures that were being put forth. They have come to look upon him as some extraordinary being, because he has extricated them from the filth in which they had lived for generations. In the short space of four months the reforms he instituted reduced the deaths from two hundred to ten per day. Not only has he increased the happiness of those people, but he has gained their entire confidence and everlasting gratitude, and is able to control them at will.

THE LAW CREATING THE OFFICE OF DAIRY AND FOOD COMMISSIONER

was passed May 8, 1886, and has been amended several times. It is probable that no law in the state has been so bitterly contested as that regulating the selling of pure food. Such is the case with any law that seeks to protect the people against frauds and unscrupulous persons. The law does not seek to prohibit adulterations of food unless they are deleterious to health, but the ingredients must be stated on the package. The law is intended to prevent deception. The law evidently has diminished the sale of worthless and injurious foods and medicines in the state, and is now being appreciated and respected. The necessity of pure and wholesome food has been recognized by all civilized peoples. The life and vigor of a state or nation

depend almost entirely upon diet, hygiene and sanitation. England early recognized this important fact, and probably no nation today is fed on as wholesome food or that as well prepared. As a result her people are strong, healthy, vigorous, and full of courage, and these attributes account largely for her accession of territory by purchase, discovery and conquest, and her possessions are found in nearly every part of the globe. The same results will hold good in armies and navies. Men lose courage as well as vigor when underfed or fed upon impure or unsound food. It is reasonable to expect that if the people in our newly acquired territory, especially the poorer classes, are fed more liberally and upon better food, and further are made to observe reasonable sanitary and hygienic measures, that a notable improvement, both physical, mental and moral, will be observed in a comparatively brief period.

The restriction of the sale of proprietary and patent medicines containing opium or its salts, and other dangerous and deleterious drugs to the ignorant and unsuspecting public, is one of the most commendable features of the law. The result of such drugs taken in a promiscuous way is too well known to the physician to require any explanation. The law is evidently doing much good and should receive the hearty support of this organization and every physician of the state.

PREVENTION OF DISEASE

Physicians have been, and now are, giving their best talent to the study of the etiology of disease and its prevention by quarantine, isolation, vaccination and proper sanitary measures; and the result of this painstaking work has entirely changed the history and management of the outbreaks of contagious diseases. It would seem almost impossible for most contagious diseases to prevail for any great length of time in pandemic, epidemic, or endemic form, as they have done in times past, now that we have

such efficient rules and regulations for their prevention and control.

Let us briefly note some of the results accomplished in recent years in the control of the more malignant diseases that have prevailed in the past. The mysterious and terrifying visitations of the cholera, as time after time it swept over the civilized world, might well have fired the imagination of Eugene Sue to create the gaunt specter stealing, as a curse, along the restless footsteps of the Wandering Jew. In 1873 the disease reached our shores, and existed in epidemic form over considerable territory, awakening the people to more thorough methods of quarantine and sanitation; and "although occasional cases have been brought by ships to the quarantine station in this country, the disease has not gotten a foothold here since 1873." Yellow fever has been introduced in this country several times within recent years, but it has made but little headway, owing to the prompt enforcement of quarantine and sanitation administered by the states in which it had gained a footing, and also by the Marine Hospital Service.

Smallpox has appeared in a mild form in a number of the states, our own included, and owing to good sanitation it has been promptly stamped out, with small mortality and but little interference to commerce. Diphtheria now makes but little progress when it appears. This is due to the strict enforcement of rules requiring the placarding of houses and isolation; whereas in former years the wide range that it took and the great mortality caused by it was appalling.

Scarlet fever is almost perfectly under control at the present day. Even when it appears in large public institutions for the education of children, many times not more than two or three become afflicted, notwithstanding they live continuously in such close relation to each other; a result achieved by the wise and strict methods employed for their isolation.

"For two thousand years the world has been deal-

ing with what has been called in Oriental countries the plague, but since the seventeenth century, clearly as the result of better sanitary methods, the plague has been practically driven from the British Isles and from every other civilized center, and has been steadily receding towards its original haunts in Egypt and Turkey, where the need of sanitation has hardly ever been recognized." Such is the statement of an English authority. The case of Dr Mueller, of Vienna is of interest. While engaged in the propagation and microscopic examination of the germ of the bubonic plague in the autumn of 1898, he became infected with the disease. The very limited extension from this focus of contagion shows to what extent the people of a crowded city like Vienna can be protected from one of the most contagious of diseases by the exercise of proper sanitary measures; there being but two or three persons who in turn contracted the disease from Dr Mueller.

It is with keen interest that we look to Cuba, a hot-bed of yellow fever and miasmatic infection, for most striking results from modern sanitation. The late Col. George A. Waring, whose knowledge of and practical achievements in sanitary science we admire, and whose memory we revere as a true martyr to the cause of humanity, reported to the government that Havana, now with a death-rate of fifty per thousand, could, by the expenditure of $10,000,000 for sanitary purposes, be made a normally healthy city whose death-rate would not exceed twenty per thousand.

The great mortality from pulmonary consumption, amounting to about 1 in 6 of all deaths in Ohio, has not been materially modified by any sanitary methods thus far employed, and demands most serious consideration from the medical profession, as statistics would seem to indicate an increase of the disorder. This may be due to the gathering of people into the larger centers of population, and to the dissemination of the disease along the crowded thoroughfares of travel. It is clearly evident that more string-

ent legislation is required to prevent the extension of contagion from those affected with the disease, as this seems the only method by which it can be limited and controlled.

The law, enacted in this and some other states, which enforces the professional care of cases of *Ophthalmia Neonatorum*, must result in much good to the state as well as to the individual. Accurate statistics show that this disease is accountable for nearly 50% of all cases of blindness. The beneficence and economic value of such a measure is apparent, for in its early stages the disorder is very amenable to treatment.

The damage to commerce caused by epidemics of contagious and infectious diseases is enormous; and not only is commerce seriously injured or quite ruined, but the death-rate at times is appalling. Thus the financial loss from the epidemic of yellow fever at New Orleans in 1897 has been estimated at $25,000,000; and in 1885, the smallpox cost Montreal 3,164 lives, besides vast treasure.

RESULTS OF NONENFORCEMENT OR NONOBSERVANCE OF THE LAWS REGULATING THE PRACTICE OF MEDICINE AND SANITATION

The prosperity, happiness, and wealth of a state or country depend upon the health of its citizens. There is no other profession or business on earth that labors continuously, using its best talent and greatest energies, to limit or destroy its own source of gain except the medical profession; and this it does, perhaps, in the face of most obstinate and persistent opposition. Yet it does not become discouraged or disheartened, but labors on, stimulated thereto by professional zeal and humanitarian motives.

It is appalling to contemplate the results that would follow the nonenforcement or nonobservance of the laws now regulating the practice of medicine and sanitation in the states and nation. But grave as this may seem, from

the persistent antagonism to these regulations that has been kept up continuously by many persons through selfish motives or ignorance, such a condition is possible, but not probable. That decadence is possible with states or nations is shown by history. "The children of Israel rebelled in Egypt because they were required to make brick without straw," and it is not possible in the case of physicians that forbearance might cease to be a virtue? It has been said that "liberty cannot prevail in a country without lawyers," and can it not be truthfully said that health, comfort and prosperity cannot prevail without competent physicians?

This state, prior to the enactment of the present law regulating the practice of medicine, had a little foretaste of the condition which would soon exist were the present laws now in force to be repealed. The state would soon become filled up with even worse characters, if it were possible, than previously infested it, inasmuch as nearly all other states have efficient and well-administered laws and do not tolerate vampires, quacks, charlatans, mountebanks and imposters who swindle the sick and afflicted. Were the laws abolished which require strict quarantine, sanitation, placarding of houses, and isolation of patients afflicted with infectious and contagious diseases; under the present thickly inhabited condition of the state, the people would be swept away by the thousands during epidemics, and we would lapse into the Dark Ages. The state would virtually become bankrupt from taxation produced by the care of its sick and disabled people. Instead of the profession in this state being overcrowded, as it is today, every man would be burdened with duties; and the young physician of good scholastic attainments, who now is bordering upon the verge of mendicancy, would soon be surrounded with prosperity and opulence. Yet the physicians are the very men, notwithstanding such prospects, who, in a large number of the states, are taking the money from their own individual pockets to maintain

laws for the regulation of the practice of medicine and for the protection of the people of the several states; the money not coming from taxation, but contributed purely out of humanitarian motives. Such a thing is an outrage and a disgrace to any state, and those engaged in making the laws for the protection of the people should be ashamed that such a thing existed in a state where they had control of the laws.

OPPOSITION TO MEDICAL LAW

There are no laws enacted but will receive opposition. This has proven true in church and state, as history will show. The church laws and state laws interfere with certain individuals whose notions and motives are opposed by their enactments. If such were not true there would be no necessity for law, as law is intended to restrain and prevent those opposed to the best interests of the majority. The most obvious opposition to medical legislation in Ohio was that which arose in the General Assembly. Much of this unquestionably came from the manner in which facts were persistently misrepresented to the members. The lobby always had its quota representing quacks and charlatans, who were constantly crying out against what they claimed was class legislation. The medical profession should see to it that hereafter in all general assemblies it is liberally represented by good, true, honest, intelligent physicians, who have at heart not only the welfare of their own profession but the good of the whole state.

A few years ago it was charged that it was the physicians themselves who opposed medical legislation and the enactment of sanitary laws. Such in the opinion of the writer is not true. They have always had the same high purpose in view, but there was a discord, which now has become harmonized, and the profession, not only in this state but throughout the nation, stands almost as a unit.

For many years past, men controlling and editing newspapers have been charged with great opposition to the enactment of medical laws. Such in my opinion is an unjust accusation relative to a large number of men engaged in journalism. There may be narrow-minded men employed in journalism who out of selfish motives would be willing to sacrifice the comfort of state and nation, but in my limited experience I have never found any such. On the other hand I have found them broad, liberal-minded men, shrewd in their perception, and in the majority of cases working for the interest of the general public. During the enactment of the present law for the regulation of the practice of medicine in the state, there was but little opposition shown by the press. True, some did not advocate the bill, but they took a passive position, and I believe today there is not a newspaper within the state that would advocate the repeal of the present medical law.

Opposition has come from still another class of individuals surcharged with spurious religion, with superstition, and with ignorance, who go about committing depredations upon the afflicted and credulous. These have a most pernicious and dangerous influence over the public from the fact that they go about under the guise of religion, and it is possible that some of our statesmen have been impressed with their fantastic claims. They allow persons to die without even palliation and send them to premature graves, as might be done in a barbarous country; and it seems as though the courts have failed to protect the people from their depredations.

THE COURTS

Human society recognizes that the rights of the individual ought to be respected insofar as they do not interfere with the greater rights of the community. The protection of human life should be the highest aim of law,

and that has been the aim and object of all medical laws that have been enacted. The law does not seek to deprive people of choice in their selection of a physician or of their preference for any school of medicine whatsoever; but it reserves the right, and wisely so, to determine the fitness of such persons relative to their educational qualifications and moral character. Notwithstanding the high object of such laws, it is found difficult, and at times impossible, to bring offenders against the law to justice because of the complex and intricate workings of the court. The presiding officer of a court has been elevated to his position and clothed with power, that he may guide and enforce the administration of laws; but when a jury of twelve men have made a finding of "guilty," and the officer of the court, after passing sentence and assessing a fine, subsequently remits fine and costs, it would seem that such officer had transcended his official authority, and thereby thwarted the will of the people and their right to protection under the law. Such an experience has more than once, and in various parts of the state, been encountered by those having in charge the prosecution of cases under the law governing the practice of medicine in Ohio. In a number of flagrant violations of the law, after a conviction had been secured by an expenditure both of effort and of money, the cases have thus been dismissed. Such action is a direct encouragement to those disposed to disregard the provisions of the law. The interest of society and the protection of human life demand that those who preside in our courts shall be moral, intelligent and competent men, fearless in the discharge of their whole duty. Public officers are public servants, and if they fail in the discharge of their duties, then their services should promptly be discontinued.

NATIONAL MEDICAL LEGISLATION

The bill S. B. No. 1063, introduced into the United States senate by Senator Gallinger, known as the "antivivisection bill," is still pending. The members of this Society

understand very well its provisions, as they listened to the very interesting report by Dr L. B. Tuckerman last year relating to this matter, but I trust that it will not be out of place to warn you that it is an insidious measure and its passage would be fraught with dire consequences to the prosecution of scientific work relating to medicine and surgery now being conducted in the government laboratories and medical colleges in the District of Columbia. Human beings are imitative and legislation is contagious, and it is safe to predict that if the antivivisection bill should become a law, similar bills will be taken up and urged by fanatics in other states, as evidenced by the bill that has been introduced into the Pennsylvania Legislature to repeal the present vaccination law now in force in that state. This action was evidently prompted by English politicians passing, last year, the vaccination bill with a conscience clause. The antivivisection bill is a menace to the profession and should never be allowed to become a law. On January 27, 1897, Senator Spooner introduced a bill in the senate of the United States providing for the establishment of a Commissioner of Public Health. It was read twice and is now pending before that body. The bill contains many commendable features, but it should be more carefully scrutinized by the physicians before it becomes a law, as the bill relates primarily to the boards of the several states. The United States has no National Quarantine. The coasts and borders should be under federal control. The Spooner bill makes no provision for the enforcement of sanitary rules applied to railroad coaches and other public conveyances passing from state to state; hence any law enacted by a state could not be enforced against conveyances for interstate use.

A NATIONAL SECRETARY OF PUBLIC HEALTH AND MEDICAL EDUCATION TO BE A MEMBER OF THE PRESIDENT'S CABINET IS DESIRABLE

The laws of the several states and of the United States are the best that exist in any nation on earth for the gov-

ernment of the people, but in order to prevent clashing and friction it is necessary to have separate and distinct heads to direct the affairs of each department. The medical profession of this country has been laboring for years to secure a representative in the President's cabinet who shall serve as a head of a department of public health and medical education, or some such title, in order to have their interests and the necessities of those they care for brought more directly under the supervision of the national government. With this in view the American Medical Association at its meeting in Washington, D. C., in 1891, in the closing hours of its last session appointed a committee to prepare a report upon this subject, and the committee subsequently brought in and recommended a most complete report. This was approved and the committee directed to bring it before Congress. The matter has since been urged from time to time; but like many other measures which have been reported to Congress by the medical profession relating to this subject, with no success.

The Republic of Mexico, on the south, has a Superior Council of Public Health, while the Dominion of Canada, on the north, has appointed a Director-General of Public Health. Surely the United States can ill afford to longer delay the action which popular sentiment endorses and will ere long positively demand. The medical profession should renew its efforts, and, uniting in a most vigorous and aggressive campaign, knock at the door of the national capital until they obtain recognition by Congress, and never relinquish their efforts until one of their number is seated in the President's cabinet.

While conscious that this address has dealt with the general subject in but a limited way, I still hope that it may have pointed some suggestions that can be utilized by the profession. If it might stimulate to more interest in the harmonious accomplishment of necessary reforms and to unite the medical profession in the protection of its sacred

privileges and obligations, it has accomplished my purpose.

If, in presenting some of the seeming imperfections of the relation of medicine to state, I have spoken somewhat warmly, I must plead in extenuation my deep interest in the end to be attained. Thanking you for the privilege of addressing you, and also of serving you the past year as your President, I would wish you, both as an organization and individually, a year of usefulness and prosperity.

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ADDRESS IN MEDICINE

THE IMPORTANCE OF THE RECOGNITION OF CERTAIN CHEMIC BLOOD-CHANGES, AND ESPECIALLY TOXEMIA, IN OUR THERAPEUTICS

JOHN V. SHOEMAKER, M. D., LL. D., PHILADELPHIA, PA.

Mr. President and Members of the Ohio State Medical Society; Ladies and Gentlemen:—Among this large and distinguished audience assembled here this afternoon, I recognize many familiar faces, of friends, who, nearly two years ago assisted in the celebration of the fiftieth anniversary of the American Medical Association, in the city of Philadelphia. The pleasant impressions and agreeable recollections of that jubilee meeting will remain with most of us as long as life itself shall endure. Some grateful memory of that occasion, I think, must certainly have moved your president to invite me to address you today. This is an act of courtesy, which I correctly construe as a compliment to the medical profession of the "City of Brotherly Love," and also to the Medico-Chirurgical College of Philadelphia, with both of which my professional life has been closely identified. It surely is an exceptional honor to be invited to appear before the highest medical society of the great commonwealth of Ohio, assembled in annual convention, and in the name of those I represent, as well as on my own behalf, I sincerely and heartily thank you. It is not for me to question the wisdom of your choice, but simply to proceed to fulfil the duty that your kind favor has assigned me. You are familiar with the exigent demands of college engagements and hospital and other professional duties, and I feel assured of your indulgence if I fail to do such justice as I could wish

to my subject on this occasion, or to this brilliant and accomplished audience.

Permit me to call your attention to the fact that our Pennsylvania State Medical Society will, in the course of a very few days hold its forty-ninth annual session. A large attendance and a full program will give interest and value to the meeting. On behalf of my fellow members of the Pennsylvania State Medical Society, I beg to extend to every one here a very cordial invitation to attend the meeting, which takes place at Johnstown, Pa., on the 16th instant, the success and enjoyment of which will be greatly enhanced by your presence.

I bring to you today a sincere, fraternal greeting from the physicians of a sister State, whose border adjoins your own as you face the rising sun. Fortunately for us, owing to the advantage of geographical position, we are in the habit of rising a little before you do in the morning; for every one will admit that it is absolutely necessary for the rest of the world to get up very early in the day to keep up with the leaders of the profession, who set the pace here in the "Buckeye State."

The spirit of the occasion impels me to speak of the importance and value to the medical profession of organization and association; but, standing as I am, in the presence of such a demonstration as I see before me, this grand illustration of a successful and influential association of scientific physicians, I need say nothing upon this subject. Any physician would deem it an honor to be counted worthy of fellowship with the representative men of the profession, who constitute the membership of the Ohio State Medical Society. Paraphrasing a familiar quotation, I might say: "If a monument were needed to testify to the advantages of medical organization, look around you; it is here!"

During the period corresponding to the life of the American Medical Association, to which I referred at the opening of my remarks, the medical profession of this coun-

try has certainly witnessed great and important changes. The standard of qualification has been elevated, the social and legal standing of the physician in the community has been advanced; and the profession has been united to an extent that half a century ago would have been considered beyond the bounds of possibility. By general consent, it is accepted as certain that the most potent and actively beneficial force in accomplishing so much in elevating the standard of medical education, of establishing State boards, and of uniting the whole profession into a great organization extending from Alaska to Florida and from Maine to Manila, has been the American Medical Association, the representative medical society of these United States of America.

Time will not permit me to do more than simply refer in passing to the magnificent work that is being accomplished by the Association, particularly through the agency of its weekly journal, which today is read by a greater number of educated physicians than any other scientific medical journal in the world. In this connection, I take the opportunity of expressing my conviction, which I know is shared by many others, that the phenomenal development and success which the Journal has recently attained, were brought about mainly through the personal effort and close attention of a man who possesses a remarkable gift for organization, an editor who has no peer in the annals of American medical journalism, one of your own members, Dr J. C. Culbertson, the able editor, now of the Cincinnati *Lancet-Clinic*.

It was suggested to me that my remarks on this occasion would find most favor with my audience, if they were upon some subject connected with Therapeutics. "All other medical studies," said Milner Fothergill, "are the foundation, Therapeutics is the superstructure." With your permission, I will ask your attention for a time to a brief consideration of "The Importance of the Recognition of

Certain Chemical Blood-Changes, and especially of Toxemia, in our Therapeutics."

Of late years much attention has been given to study of the physiology and pathology of the blood. From the crude instruments and imperfect methods employed only a few years ago, we turn with pride and gratification to the improved equipment and perfect technic of the present day. We now, as a matter almost of routine, ascertain the percentage of hemoglobin and determine the actual and relative richness of the blood in red and white corpuscles. By staining methods we also determine the presence and proportion of hematoblasts and eosinophil cells and observe other evidences of pathologic conditions. Examination of the blood for the malarial organism, or for the pathogenic bacteria, is now a part of regular clinical work. Simple and very practical methods have been devised and are in use for ascertaining the specific gravity of the circulating fluid and for the determination of the proportion of iron which it contains. In view of all the improvements in our apparatus and technic, only a few of which I have mentioned, I think that you will agree with me that we are better prepared to take up the pathology and therapeutics of the blood at the present day than at any preceding period of the history of medicine.

Virchow is said to have declared that "Disease has a material *ens*, it is the altered cell." But we know that, in many instances, the *cause* of the alteration of the cell is an antecedent change in its blood-supply, which has affected its nutrition and impaired the performance of its functions. We are therefore thrown back upon certain pathologic conditions, or constituents, of the blood, which must be changed or removed before healthy cell-growth and normal metabolism can be reestablished.

This may appear to you like a return to the old humoral pathology, but on the contrary it is the most recent development of medical science. It is a result of the utilization

of all the resources of modern medicine in the direction of the investigation into the causes of the phenomena of disease and of the means to be employed for its relief. We are reminded of the illustration given by a distinguished scientist, a few years ago, in speaking of another department of science. He said in effect that "knowledge advances not in a straight line, but as it were in a spiral, so that while the pendulum appears to swing back to a former position, it actually occupies a higher plane than it did before."

Accepting the old rule of practice embodied in the words "*Obsta principiis*" it becomes very evident that in our therapeutics it is of the highest importance to recognize the true nature of the alterations in the blood, which cause, or are attained by, cell-disturbance. It is acknowledged that many of these alterations are at present beyond our means of recognition except through their effects. They may be provisionally divided into three classes according to their character:

1. Those in which there is a diminution or absence of certain principles of the blood, which are necessary for healthy cell-development and metabolism. In illustration the instance occurs to me of the peculiar bodily disorder and mental impairment caused by the removal of the thyroid gland, thus depriving the blood of some important internal secretion necessary for health. The proof of this hypothesis is supplied by the process of induction pursued by Dr Murray, of New Castle, England, who has shown us how to cure myxedema and allied conditions by the administration of thyroid glands of the sheep, or of the thyroid extract. When we treat anemia with iron, rickets with lime-salts, scurvy with lemon-juice, or neurasthenia with hypophosphites, this principle is followed of supplying to the blood certain proximate principles, which are needed for healthy metabolism.

We know that some individuals are naturally insusceptible to certain infections and that everyone possesses a variable power of resistance to infectious diseases. Very recently we have learned that this absolute, or comparative, immunity is due to the presence in the blood—we are not at present concerned with the question of how it gets there —of some constituent which we call for convenience "Antitoxin." You anticipate my argument, I am sure, that where the natural antitoxin is deficient and fails to protect the system, the introduction of antitoxin from a source without the body becomes a rational therapeutic procedure. That this has been successfully accomplished in the case of diphtheria, we are all aware. With less success, but still with promising results, similar experiments in this field have been made and are yet in progress, in the treatment of erysipelas, tetanus, typhoid, tuberculosis, plague, pneumonia, cholera and yellow-fever. In the case of vaccination against smallpox, the conditions are not quite the same, for here it is sought by inoculating the system with vaccinia, to cause the body itself to supply such an increased amount of antitoxin against variola, as will enable it to successfully resist exposure to infection of this kind.

2. Those in which certain principles, normally present in the blood, are in such relative or actual excess as to disturb metabolism. Illustrations of this are numerous. Diabetes for instance is a prominent one, since we all admit that there must be glycohemia before there can be glycosuria. The clinical manifestations of gout, lithemia and rheumatism, such as asthma, bronchitis, psoriasis, iritis, and urinary disorders, we all take into account in our therapeutics. I need not discuss this point further in the presence of such an audience as there is before me today.

3. Those in which abnormal elements in the blood disturb cell-action and cause manifestations of disorder, or symptoms of disease.

I will not now take up for discussion the effects of certain poisonous substances, with which we are all familiar, such as lead, mercury, arsenic, or even alcohol, tea, or coffee, since we daily take them into consideration in prescribing for our patients. What I especially wish to direct attention to, is the often-overlooked consequences of the presence of products of bacterial growth, which are absorbed into the blood, and are known by the general term of toxalbumins or toxins. I am not now speaking of the familiar illustrations afforded by typical cases of infectious disease, such as the specific fevers; but of the more obscure cases in which the connection between the cause and effect is less evident.

Thus we find that in certain cases of indigestion, as pointed out by Lauder Brunton, from the mass of fermenting food in the stomach or intestinal tract, certain poisons are absorbed by the blood, which give rise to symptoms popularly grouped under the general title of "Biliousness," which includes loss of appetite, nausea, weakness, muscular pains and headache, depression of spirits, and so on. They are as "Familiar as Household Words" to us all. How often have we found skin affections, such as eczema, caused or maintained by a similar condition of the digestive tract? The gastrointestinal origin of toxins has now been demonstrated to exist also in tyrotoxicon (cream-puff, ice-cream, or custard) poisoning and also in botulismus or sausage-poisoning. These symptoms are capable of being developed, under certain circumstances, therefore, by ordinary saprophytic bacteria. There are also cases of toxemia from common forms of pus-bacteria, the streptococcus and staphylococcus. Thus Dr George H. Rohé, shortly before his lamented death, published a paper declaring his conviction that postoperative insanity is due to sepsis. A very remarkable instance has been recently reported, of a woman who had for years suffered with a lupus of the face which had resisted the usual methods of treatment. In this case

the lupus underwent a spontaneous cure after removal of a Fallopian tube which was found to be distended with pus. When the source of the toxin was eliminated by removing the pus-tube, the natural antitoxin of the blood was apparently able to cope with the disease and to cure it. We recall also in this connection the curative effects that have been obtained in some cases of lupus from injections of tuberculin.

If we are asked more specifically about this peculiar quality of the bacteria, which we have termed virulence, and its relation to toxemia, we must confess that we only know that it exists and, as Pasteur has shown, that it is a variable quality; that is to say, that bacterial inoculation is not necessarily followed by bacterial infection or toxemia. The importance of this fact to us as physicians is very great, for, from the clinical standpoint, the difference between a virulent diphtheria bacillus and a nonvirulent diphtheria bacillus is as great as the poles, or as Heaven is from Hades.

Directly in this connection, there is a very interesting clinical fact to which I would like to call your attention. It is now finally established, by recent bacteriologic work, that air-borne bacteria, of all kinds, including, therefore, saprophytic and pathogenic varieties, are constantly found in the nasal mucus and in the glandular tissue of the nasopharynx and tonsils. For instance, it has been shown that in case of chronic rhinitis and tonsillitis, diphtheria bacilli may be found in the discharges, without being attended by the typical and characteristic symptoms of diphtheria. In such cases the bacilli do not seem to possess their full degree of virulence, or the system of the individual is possessed of a higher degree of resistance, so that the toxins are not produced in sufficient quantity to cause the profound toxemia, which characterizes the disease that we call diphtheria. At the same time we must not assume that this quality may not under favorable circumstances be manifested, for we believe that such patients may communicate

true diphtheria to susceptible persons who come in contact with them. The point which I wish particularly to make is that, although the diphtheria bacilli in such cases do not elaborate enough toxin to produce symptoms of acute poisoning, yet they *do produce a certain amount* of their peculiar poison and this mitigated toxin, if you will, being constantly absorbed by the blood, is capable of causing ill-health and cachetic conditions, including eruptions on the skin, especially in children. I feel warranted therefore in stating that in many otherwise unexplained conditions of anemia, neurasthenia, and impaired nutrition, the cause will be found to exist in toxemia due to a chronic diphtheria-infection of the upper air-passages.

The remedy is a very simple one in this class of cases, all that is necessary to do is to disinfect the nose and throat and correct the morbid condition of the blood.

The condition of icterus has an origin in the blood in a greater number of cases than has been hitherto supposed. We know that the introduction of a certain chemic substances into the circulation will cause destruction of red blood-cells and in consequence the appearance of pigments of reduced hemoglobin in the blood, the tissues, and the urine. Two factors are necessary for the production of this form of jaundice, an excessive destruction of blood in the spleen and an impaired cell-action in the liver. For example after the administration to animals of poisonous doses of toluylhydrazin and metaphenylendiamin, both of which cause jaundice and icteric urine, the spleen is found to be very large and enormously charged with a golden-yellow pigment. The portal vein and the capillaries of the liver are also highly colored by this pigment, carried over from the spleen, which is the organ of blood-destruction. The liver-cells are pale and in a state of fatty degeneration, but quite free from pigment. There is much pigment in the blood of the hepatic veins and pigment granules are found in the secreting structure of the kidney. Thus granular pigment,

which is brought to the liver from the spleen, is carried over into the general circulation and undoubtedly pigment existing in a soluble form in the blood plasma is also carried over. Thus we see, that under certain circumstances the pigments of reduced hemoglobin, including bilirubin, will be carried beyond the liver into the general circulation staining the tissues, discoloring the urine, and bringing about a true hematogenous jaundice. This corresponds to the jaundice due to the absorption of the decomposition-products of a large extravasation of blood, as Virchow has shown that the hematoidin is in this case identical with bilirubin. In cases of low fever therefore accompanied by swelling of the spleen and destruction of red blood-cells, we may have absorption of the pigment from the reduced hemoglobin, followed by the development of jaundice, and yet the liver and bile-passages be unobstructed.[1] In such cases our therapeutics should be directed to the blood and the spleen rather than the liver and intestinal tract.

Albuminuria is likewise occasionally due to toxins or to certain products of waste, which accumulate in the blood. In such cases the kidneys may be free from disease and the albumin will disappear from the urine when the blood is restored to a healthy condition. In the albuminuria of pregnancy, for instance, it is a common observation that the symptom is relieved by the induction of premature labor. In an instance reported[2] some years ago, disease of the liver and kidneys of the fetus *preceded* the appearance of albuminuria and general anasarca in the mother, thus affording a unique instance of the production of Bright's disease of the kidneys through some toxic substance circulating in the blood, because there was no direct connection between the mother and fetus except the blood in the placental sinuses. Some years ago Drs DaCosta and Long-

[1] Aulde, *British Medical Journal*, January 18, 1896.

[2] Grimshaw, *Liverpool Medico-Chirurgical Journal*, January, 1895.

streth[3] showed that in certain cases of Bright's disease there was disease of the nervous ganglia, especially of the abdominal plexus of the great sympathetic. It would seem probable, or at least possible, that previous to the disease of the nervous ganglia, there had occurred some change in the blood affecting their nutrition, in the manner such as we have just been engaged in considering.

I shall not stop to discuss at greater length how much the recent views as to the pathology of the blood and especially the presence of toxins elucidate other vexed questions in clinical medicine, nor shall I have time to point out in detail the numerous therapeutic applications that may be made of it. It is a very old truth that Kee Nephesh Habassar Baddom, "The blood is the life of the flesh," and modern science fully confirms it.

Susceptibility to infection is the reverse of immunity, and appears to be due to the absence from the blood of certain protective constituents, or antitoxins, just as immunity is maintained by their presence. This is an inviting field for further study. Promising results have been obtained, as I have already stated, in a number of diseases. Experiments have also been made in the field of surgery, in the prevention of suppurative processes, and also in the treatment of malignant growths. Dr Coley of New York has obtained remarkable successes in treating inoperable sarcomas by the use of cultures of the *bacillus prodigiosus*, and of the streptococcus, and it is hoped that shortly there may be announced the discovery of a successful treatment for cancer by the adoption of similar methods. The uniform failure of experiments in which it was sought to inoculate animals with cancer, would indicate that the exciting cause of carcinoma does not reside in the lesion itself, but is remote from it. In other words, it is due to a disturbance

[3] *American Journal of the Medical Sciences.* Philadelphia, 1880. V. S. LXXX., p. 7.

of nutrition which may be explained by the presence in the blood of some toxin.

I will leave this subject for your consideration and will conclude with a single remark, which has a direct bearing upon practical therapeutics. The recognition of the rôle played by antitoxins in producing disease and of the therapeutic value of antitoxins and organic extracts of various kinds, has placed in our hands a new class of remedies. Some like diphtheria-antitoxin, and thyroid and suprarenal extracts, have already obtained an established place in our medical armamentarium, others, such as tuberculin, and cultures of streptococcus, mallein, *bacillus prodigiosus*, etc., are still on trial. In the near future there is no doubt but that their number will be greatly increased.

I would suggest that, owing to the difficulty of ascertaining, or establishing, a standard of activity, or potency for this class of remedies, some supervision by the profession, or by the government, should be held over their manufacture and sale, just as in the case of dairy products and vaccine. It is extremely important that these peculiar remedial agents should be supplied to the profession of standard quality and uniform strength and entirely free from tubercle bacilli or other infectious material.

Mr. President: In a recent address delivered at Chicago, Gov. Roosevelt, of New York, spoke eloquently of a form of bodily and mental activity, which he characterized by the apt title of "Strenuous Life." To the possession of this, either by a nation or an individual, he would directly attribute the secret of success. He also declared that the great need of the community and country is cultivated men and that cultivated men need character. In his opinion a man who looks forward to a life of mere selfishness is not respectable, and no man is to be excused from doing his share in working for the common good. Whether or not, the distinguished speaker had the members of the medical profession in his mind when he uttered these words I know

not, but I am convinced that the physician more than any other in the community works for the common good; he is unselfish, he has both culture and character, and in his daily work he demonstrates the value of that "Strenuous Life," to which reference has just been made. The degree of success he has obtained in this Commonwealth could find no more forcible or convincing demonstration than I find represented in this audience before me today.

ADDRESS ON SURGERY

MEDICAL AND SURGICAL LESSONS OF THE LATE WAR

P. S. CONNER, M. D., CINCINNATI

War has long been a great teacher of surgery; in hardly less degree of medicine. From hospital and camp has come much of the knowledge that we have of the nature of wounds and the characters of disease. Strike from the record the report of the labors of military surgeons from Paré down and the gap in professional literature would be wide and deep. Again and again military surgeons have made contributions of great value. If there were nothing more from them than the writings of Hunter, of Larry, of Guthrie and of Langenbeck based on what they saw as military surgeons, we still would be compelled to give great credit to the military men of our own profession. For a half-century, after every large war, the first question has been—what can be learned from the horrors, the wretchedness, the misery of these years of conflict? The Crimean war reports were of great value. Those made in our own country, the result of observations during those dreadful years of '61 to '65, constitute what I believe to be the noblest contribution to medicine ever made by any men in

any country. The wars that followed, the Franco-German and the Russo-Turkish, were of importance as to their professional results, that were set forth in many contributions from the surgeons engaged therein.

In the last twenty years two questions have been seriously occupying the minds of all military surgeons; first, what can be done in the way of antiseptic and aseptic surgery in military life and what will be the results of it, and second what will be the differences in wounds and their treatment consequent upon the change in arms.

A few reports were made from the Russo-Turkish War respecting the value of antiseptic treatment but you can count them all, as it were, upon the fingers of a hand. There have been wars since, fighting in South America, fighting in Asia, fighting in India, fighting in Africa, fighting in Egypt, fighting from one end of the world almost to the other, for the God of War seldom sleeps long. But the contributions from these sources have been so few that at the beginning of our own late conflict we knew very little as to what could be expected in the way of antiseptic surgery, and it was a question open for discussion whether it was possible to properly apply the principles of antiseptic and aseptic surgery in military life, and still more whether anything like the favorable results with which we are familiar in civil life could be secured from such application. There has been but little added, so far as I am able to learn, by our late war, but that little is of value.

During the Spanish War, which may be said in a general way to have lasted five months—from the first of May to the first of October—we had only about 1,600 wounded, less than that number, practically about 1,400 in all, wounded in Cuba. As was said by General Boynton (and nothing could be said with more truth) every two days for six long weeks during the Virginia campaign of '64 more men were killed and wounded than died of wounds during our whole Spanish affair. But we have found as the re-

sult of the labors of our medical men in Cuba that wounds were recovered from in extraordinary proportion. It seems very strange, for example, to those who are familiar with what happened years ago and with the literature of the wars since, it seems very strange that one may say as I say now, on the authority of those who were engaged in the conflict, that of twenty wounds of the knee-joint not one died in consequence of the injury.

It was a question when the war commenced whether or not the "first-aid package" would be of service. Such packages, distributed in large numbers, were in the beginning again and again thrown away by the men to whom they had been issued, but those used proved of much value in protecting the wounded against the dangers of sepsis, and we all know that from 85% to 90% at least of the deaths from wounds prior to the antiseptic period were due to sepsis. These packages, applied though they often were by untrained men, proved to be efficient protectors of life. Even with the application of them true complete antiseptic treatment was hardly possible in Cuba, since the wounded seldom or never had change of clothing and very generally there was no way of cleansing the wounds. Often it was found that the men arrived in the north wearing the same dirty clothing that they had when they went into the fight on July 1 or 2. The washing and cleansing too often was confined merely to the part injured, the rest of the body being as unclean as it must necessarily be when men are exposed to rain and mud and dirt with no change of clothing, and scarcely an opportunity for bathing. We may properly say as one of the lessons of this war that the "first-aid package" is of itself of great value, that antiseptic measures can always be applied in a degree, and that, though imperfectly applied and the treatment defective as we should regard it in ordinary civil life, the good accomplished is very great.

The second question that occupied the public mind for

so long a time was—what would be the changes produced in wounds as the result of the changes in armament, and the employment of a hard lead bullet of small caliber metal-jacketed, propelled with a velocity at least one-half greater than before. What would be the effects of this light missile as compared with those produced by the old time caliber .55 musket-ball? A few facts had been obtained from the surgeons in connection with the English, Chilian and Venezuelan armies which as far as they went seemed to indicate that the experimental results secured in England, on the Continent and in America would be confirmed in actual warfare. Those who had been experimenting insisted upon it that with the new bullet there would be produced flesh wounds of exceeding mildness, that parts would be opened up rather than torn through, that the areas of contusion would be limited, that when bone was struck if the individual wounded was in the so-called middle-distance outside the first 300 to 500 yards and inside the range of from 2,000 to 3,000 yards it would be either bored through with very little damage or broken into large pieces, rarely comminuted as it used to be when the ball was large and soft, mushrooming when it struck. Every report that I have been able to receive from those engaged in the conflict in Cuba has confirmed this statement. Again and again individuals wounded through bone in a comparatively very short time were able to resume duty. Visceral wounds if they did not prove immediately fatal, were recovered from in an extraordinary degree. Wounds formerly regarded as necessarily mortal or almost so were recovered from in quite fair proportion. In cases of penetrating wounds of the abdomen it would seem that recovery was more likely when they were let alone than when interfered with. Four laparotomies were done, and every man operated upon died. Wounds of the lungs were recovered from in unusual proportion as were those of the head. Blood-vessel wounds, if not quickly mortal, gave

little or no trouble afterwards, though a few cases of traumatic aneurism were observed. There is not on record, so far as I can learn, a single case of external hemorrhage followed by death, though those brought off the field with internal hemorrhage died in a considerable proportion of the cases reported.

It was thought, as a result of experiment, that the long, hard, smooth, rapid-flying bullet with its low trajectory would never split and would never lodge. For some reason or other the results in Cuba indicate that this is far from being true. It has been stated that the proportion of lodged bullets ranged from 10% to as high even as 30%, and the explanations given have been that the powder used was not good; that the bullets flying through the heavy grass (the almost jungle of the country) lost in considerable measure their propelling power and as a consequence lodged, when under ordinary circumstances they would have gone through; and lastly, and probably this is the correct one, that it was due to the great and rapidly developed loss of energy due to the light weight of the missile. As respects the splitting up of the bullet, it can only be said that it was not infrequently observed.

The important surgical lesson to be learned from this late conflict is I think that wounds which are not in and of themselves necessarily mortal will be recovered from without operative interference in the great majority of instances. During the whole war less than 100 major operations were done. Of the whole number of amputations reported up to October 1 (34) only four were primary, every one of them for shell not bullet wound. We may say then that this war has demonstrated the correctness of the remark years ago made that the modern bullet is a humane missile, it either kills or it puts the individual in a position to recover, or at least gives him a fair prospect of recovering.

Antiseptic treatment can be employed (rather antiseptic

than aseptic, for asepsis is almost an impossibility) and employed most advantageously. One difficulty encountered in previous warfare was the carrying in of pieces of the clothing with the bullet, and such clothing must necessarily prove a certain focus of infection, while the bullet itself may generally be regarded as sterile. All observations show that such pieces of clothing are rarely to be found in the depths of the wounds made by modern bullets.

The lessons of greatest value to us, the great majority of the lessons received, are those which have reference to the organization of the medical department of the army; to the administration of that department; to the diseases that prevailed and the prevention of them, or what should have been their prevention; and their fatality. When the war broke out we had but a little army, admirably trained and in splendid condition. It was increased from 25,000 to 60,000. There were called out on the first call 125,000 volunteers made up of the National Guards of the various states, and about a month later a second call was issued for 75,000 more, though the number fell a little short. The National Guards were supposed to be somewhat familiar with military matters, to have medical supplies, and to have medical officers who were capable not only as respects the care of the sick, but also as regards their watchfulness of the interests of the men who were not sick. It proved, (and I believe this will always be the case until radical changes are effected in the organization of the National Guard,) it proved that however good they might be as purely medical men, these surgeons as a rule were absolutely unacquainted with those many things that are demanded of medical officers in an army which have no direct reference to the care of either the wounded or the sick. Neither line officers nor medical officers were familiar with the methods of securing supplies, and were either unacquainted with the principles of camp sanitation or grossly neglectful of them. They were unable to instruct the men how to take care of themselves, or they

failed to instruct them, and as a result we had a degree of sickness which was far in excess of that which ought to have prevailed during that short period of five months. True it is that every new levy of troops necessarily has its period of sickness; it must as it were become acclimated. Soldiers are like children in more senses than one. As the child has the diseases of childhood so the young soldier has to go through his period of training, of development, of camp-sickness, and during this period he suffers immensely, and death occurs in no small proportion of cases.

The troops called out aggregated at a few large camps of instruction. These, with few exceptions, were selected without consultation with the medical authorities of the army, without consultation with any medical authority whatsoever. As a result many of the camp-sites were far from suitable, and the men were crowded together to an extreme degree, not even scattered over the ground that they might have occupied. For reasons that we have never been able to understand they were closed in, one regiment upon another, a brigade occupying territory which should not have been occupied by more than a regiment, a regiment an area that should not have been occupied by more than a company, certainly not by more than a battallion. As a rule they were unable to take the precautions which they should have done. A large proportion of the sickness of the war was because of the neglect of the principles of sanitation, principles thoroughly well known, that should have been applied. The lesson to be learned here is apparent to everyone. Never again should an army of volunteers be sent out until it has been so trained that it in some measure knows how to take care of itself, and until its medical officers have learned that the care of the well is of more importance than the care of the sick. Never again should there be the aggregating of men in such large numbers. They should be scattered so that they may be protected against the evil influences of over-crowding.

The National Guards should be so trained in time of peace, in the states in which they are located, that they may be able to take the field within a reasonable time trained to a degree to permit of their being protected against unnecessary and preventable disease. Our troops were sent from the north to the south in the late spring and early summer. They were sent with the same clothing that they had in the north, they were exposed to climatic conditions with which they were utterly unacquainted. There was so little consideration of their welfare that their food was not as it should have been, their cooking was most defective, their water-supply was not abundant nor always protected against infection. As a result they were but a comparatively short time in these large camps, even those far enough north to be in the state of Tennessee or the state of Virginia, before they were found to be breaking down.

Every man that knew anything about camping in the southern country knew that malaria should be expected, that it would come, that it would debilitate. The malaria of this State, the malaria of Kentucky, the malaria of Illinois is bad enough, but it is not anything like as severe as the malaria of Alabama and Florida, to say nothing of that terrific malaria which prevails in tropical and semitropical countries. The malarial fevers of Cuba were of an extraordinarily violent character. They broke down those men as I have never seen men broken down before. Weeks and weeks after their return from Cuba they were so weak, so wretched, so miserable that it was even then true as was said when they landed at Montauk Point, their condition was "pitiable." Many of them have not recovered up to this time. The effects of their short stay in Cuba will be felt as long as the men of that command are left. This condition might have been prevented in some measure, but certainly in large extent it was unavoidable. All history shows that troops sent into tropical countries in the summer and exposed to the conditions that necessarily attach to active campaigning,

will break down, and that rapidly. From the English and French movements in the West Indies the evidence long ago came that a very heavy mortality must be expected in any army which goes into these countries. Rains, heat and the depressing influences that prevail have added to them all the conditions which are consequent upon the setting free of the malarial organisms in great plenty, and the result is that the individuals are so debilitated that they cannot resist any other disease that may attack them.

It has been said that these conditions were consequent upon the want of shelter due to the absence of tents, upon the character of the food, upon the want of medical supplies, etc.; but the plain fact remains that whatever the food, whether the men were sheltered or not, whether properly cared for by their officers or not, whether supplied with medicines or not, disease prevailed under one condition as badly as under another. Major General Wood declared in my hearing that, if he had been asked in the month of August what was the occasion of the terrific breakdown that occurred, he would have said that it was owing to the want of shelter, to the want of proper food, to the want of medicine, and to the want of necessary military precautions, but since that time his opinion had changed. He had seen men coming from the north in comparatively good health not exposed to any particular hardships, having good shelter, provided with good food and in proper amount, break down as rapidly and completely as the men of the Fifth corps did during the months of July and August. The lesson to be drawn from this is what? That when we send men into these tropical countries, we must expect that they will be sick, we must provide shelter for them as best we can, give them such food as is proper for them, we must see that they have everything possible that is needful for them, but we must expect at the same time that they will break down in large numbers and will require a rapid change from the southern to the northern country. Having extended our limits so that one arm

touches the outposts of the Antilles and the other extends nearly over to the Chinese shore, we must necessarily in the future have much to do with campaigning, with the assembling of troops, and with their maintenance in tropical countries. These men must be watched over as well as they can be; relieved from all unnecessary labor; protected from the sun, the dews and the rains; and fed in such a way as will be best for them under the circumstances.

But bad as were the malarial fevers, typhoid was worse. Always one of the scourges of armies, it did not prevail to any great extent until after the expiration of the first two or two and a half months of camp life, but it was present long before, having been carried into the camps in Virginia, in Florida, in Tennessee, from the states from which the troops came. Its extension might have been and should have been greatly limited. Its nature was misapprehended again and again, it having that peculiar complexion which belongs to the typhoids of the southern country, with which there is so often combined malarial disease, or they are engrafted upon a malarial stock. Called malaria, it was treated as malaria until it became such a scourge that it was no longer possible to regard it as anything else than typhoid. Here as I look at it, is one of the great lessons to be drawn from the war. Medical men having charge of troops should know what they are likely to find in the camps. But how are they to know the difference between malarial fever on the one hand, and typhoid on the other? It is now comparatively easy to make the diagnosis, though in a certain number of cases not for a considerable length of time, and everyone connected with the medical department of the army should be familiar with the present methods of distinguishing the one affection from the other, and having distinguished it should take such measures as may at least in some degree prevent its extension.

It is a fact to the credit of the army that though typhoid

extensively prevailed the cases were recovered from in an unusually large proportion. Of the 14,000 cases reported only 906 died, about 7 per cent, a mortality that can be matched and has been exceeded again and again in our hospitals, in our cities and in our country places where it is supposed that every possible care is given to the sick. In the city of Philadelphia from January to April there were one-half as many deaths from typhoid as during the late war, and yet we are not willing to say that the sick are not properly cared for, are not properly treated, in the city of Philadelphia.

We are sure that the army ration, good as it is, is not quite the proper one for the soldier in the tropics. There must be a change made so that the proper kind and supply of food will be received.

I am inclined to think that as the result of the investigations that have been ordered, but not yet entered upon, we shall have such a change in the food-supply of our troops and their general equipment as to enable them to do their work better and with greater protection against such conditions as prevailed last summer. You have heard of the starvation that our men experienced. That starvation, so-called, in the great majority of instances, depended upon one or the other of two causes, either upon the fact that men were convalescent from typhoid and had of necessity to be fed with the greatest care, or else were the subjects of that pestilential malaria which renders the body incapable of assimilating the food taken into the mouth.

The typhoid which prevailed should not only teach us that we ought to protect against it, but further that men who are sent to war should be provided with what we know to be absolute necessities for the proper care of those sick with this affection. Especially must they have nurses. The nursing of our army was simply wretched, and that because we had no fit nursing force. We had in April last a hospital corps of less than 700 men, but such hospital

corps though trained in litter-bearing and first-aid dressing was almost not at all so in the care of the sick. The Congress of the United States made no provision whatsoever for a hospital corps in connection with the volunteer army other than permitting the regular corps to be increased. But enlistments for it could not be had. Of the hospital corps of the National Guards—and Ohio had a good one—none could be retained and of the individual men of such corps few or none went into the service and of those who did many were kept in ordinary line work. To supplement this little hospital corps, details were made from regiments, and any man who remembers the civil war recollects what the character of the detailed nurses was and knows what it always will be. Every company commander detailed those men who were of the least value for fighting, perhaps lazy and worthless, and such men were dumped into the hospitals to take care of the sick. You can understand what sort of care the sick must have had. It was not until July 15 that women were called for in any considerable number. Hundreds of offers were made during the early weeks of the war, but of all these offers before July 15, only 150 had been accepted. By September 1 we had 1,500. The war demonstrated that female nurses are of value in military as in civil life, that they can be secured in any desired number, and that they can be cared for properly and will in turn care for those entrusted to them. It was one of the glories of the army that of the 1,500 of these women nurses employed in hospitals and camps from not one was there a word of complaint of any personal discourtesy ever shown to her. It was most seriously questioned and not without reason, whether the front of the army was the place for a woman, and I do not blame those who thought that woman's place was elsewhere. But our experience has shown that woman's place may be at the front, at least as far as the base hospitals. The reports had from the female nurses employed in the field are as satisfactory as those from Montauk or other points in the north.

This is one of the most important lessons, perhaps the most important, to be drawn from this conflict—that we are not compelled to depend upon untrained men who although well disposed, are lacking in knowledge, but that we can turn to the great body of female nurses who are so serviceable in our hospitals and private practice. Arrangements should be made that they can be an integral part of the army organization; not that they should be enlisted or brought out in any large number, but that there should be a list kept in the War Department at Washington of those willing to serve if necessity arises who can be looked to with perfect safety and full assurance. It would not be imposing much of a duty on those willing to offer their services as nurses to have them report their residences to the War Department at stated times, and if another war should come we might then have a trained corps of efficient nurses.

From now on we probably must be a fighting nation, and must provide the means for taking care of the sick. If such arrangements were made, and a proper hospital corps organized it would be a great advance on anything that has preceded, and would almost compensate for the wretchedness of Camp Thomas, Montauk, Florida and Cuba.

If the army is to be maintained of any large size it must have men capable of doing the work that is imposed upon them, or they will not be able to endure the hardships and live through the climatic conditions to which they necessarily will be exposed.

A most unfortunate thing in the history of this war was the lowering of the entrance age from 21 to 18. It is nearly a century since Napoleon wrote back to Paris, "For God's sake send me no more boys, they fill up my hospitals." If the age-limit had been maintained, many of those that were sick would have been left at home and been well.

Not only must the army be recruited from full grown men, but from healthy men. The National Guards as they were originally called out were fairly well examined, and the

men in the ranks were in fairly good condition, but again and again among the 75,000 later called out were found men absolutely unfit for service. It was said that they had been medically examined and had been passed; if so great blame attaches to the medical examiners for their gross carelessness. Men with hydrocele and varicocele, with hernia, with fractures badly united, with consumption even, were sent to the front only to be transferred to the hospitals, totally unfit for military service. We must see to it in the reorganization of the National Guards that the medical officers shall exercise the proper control over the entrance of the troops, and that the enlisted men are fit for soldiers. There are many lessons to be learned as respects care in individual cases, and the great underlying principle of proper selection will certainly demand constant attention. It should never be that a regiment while being prepared to go to the front should have more than one-fourth of its whole strength in hospital in one month with typhoid. The worst record in the history of the war is that of the Fifteenth Minnesota which, while encamped at St. Paul and Fort Snelling, had 250 cases of typhoid in the month of August out of a total strength of less than 1,000. We may certainly reasonably ask that typhoid shall be prevented and that malarial conditions shall be relieved in such a way as to at least limit their deleterious influences. If we are to raise armies to send to Cuba, to the Philippines or to any other territory, the men should be trained in the healthy districts from which they come, and the medical officers should learn that there is something more connected with the duty of a military surgeon than simply caring for the bullet-wound which may occur, or the sickness which may exist.

Our war was so short and so peculiar that the lessons are few. They are however distinct and have reference to the protection against septic infection and against disease, the securing of proper nursing of those who are sick, avoidance of the overcrowding that is productive of evil, protection of the men against their own vices such as was not

afforded during this last war. Vice and immorality produce their effect, and vice and immorality if they have no other effect undermine the constitution of men and render them so vulnerable that a very slight complicating disease will be sufficient to turn the scale against them.

It is to be hoped that there will be no immediate occasion for the application of the lessons drawn, but it behooves the watchful of us to take these lessons to heart and to see to it that certain of these evils never again prevail. Never again should it happen that when war is declared there should not be medicines and medical supplies for the troops. When this Spanish-American war commenced there was not even a three-months' supply for our army of 25,000 men. It was expected that the National Guards of the various states had their supplies; but when they were called for, sixteen states had absolutely nothing, and the number of those properly supplied you could count on the fingers of a hand. A few others had some supplies but not enough to last for a period of three months. We were absolutely unprepared as respects medicines and medical stores as we were absolutely unprepared in many another way.

Further than this a lesson of great importance is that the medical staff of our army should be so increased that we may have men enough to answer the requirements of the day. The National Guards had their doctors, three in number, the regular regiment had but a single doctor. As these men broke down under the strain there was great difficulty in supplying the deficiency. A few, less than 100, were brought in as a medical staff of the volunteer army and a much larger number under contract, but much could not be expected from them having, as they must of necessity have had, more devotion and patriotism than knowledge. When the strain came upon the army in Cuba there was a great deficiency of medical men and as the medical men broke down the deficiency became all the greater. It certainly behooves the country to see to it that we are prepared for war and in no respects more so than in the number and character of the medical officers of the service and the abundance of hospital supplies.

Chapter III—Medicine

THE DIFFERENTIAL DIAGNOSIS OF SMALLPOX

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Smallpox formerly included the whole exanthematous group, and what we now regard as distinct affections were supposed to be varieties of but one disease. Measles was the first to receive recognition as a disease *sui generis*. Scarlet-fever followed in due course of time, being first described as a separate affection by Ingrassias of Palermo in 1555.[1] Although the process of elimination has gone on during the centuries, it is not yet wholly complete, for some, following the teachings of the Vienna school, still regard varicella as a modified form of smallpox. Although this elimination has simplified the study of variola, yet another influence was introduced by Jenner which renders the recognition of variola oftentimes a matter of great difficulty. In cases of typical smallpox this difficulty need not be experienced, the appearance of the disease being so striking and many of the symptoms so distinctive that it cannot well be mistaken. In former times the principal obstacle in arriving at a correct diagnosis lay in the severity of the disease, while today the mild nature of the affection as frequently encountered, gives rise to the main difficulties in its recognition.

During Sydenham's time, the *black death*, which has since been recognized as the most virulent form of hemor-

[1] "Nonnulli morbillos et rosaliam eundem esse morbum existimarunt; nos ipsi nostrismet oculis diversos eorum affectus esse videmus; morbilli enim racematin venire solent. * * * Etsi nonnulla scarlatinae symptomata desiderantur, tamen accurata exanthematis descriptio, et cum morbillis et variolis comparatio, hunc morbum subintelligendum esse verisimile reddit." Ingrassias, Joh., *De Tumoribus praeter naturam.* (Neapoli, 1556) cap. i, p. 194.

rhagic variola, gathered in its countless thousands, even before the first distinguishing features of smallpox had appeared. With the advent of vaccination, and possibly of better hygienic conditions, all this has passed away and a lesser, though not a less difficult problem presents itself in the differential diagnosis of smallpox. That the virus has changed we do not believe, for in every epidemic the confluent and hemorrhagic forms are met, with all the characteristics of their old-time severity. The most convincing proof of this assertion was witnessed in the Canadian epidemic of 1885, when, as Osler expressed it, the disease spread like fire in dry grass.[2] This is accounted for by general prejudice against, and neglect of vaccination, as well as the defective sanitary conditions in which many of the people lived.[3] While general vaccination has changed the prevailing form of the disease, it has given us varioloid, which at first was not considered true smallpox—hence the name. Varioloid may be defined as true smallpox following a mild course and characterized by numerous exceptions. Smallpox does not always follow a uniform course, nor is it of equal severity in all persons attacked. In severity it likewise differs in different epidemics. Undoubtedly individual peculiarities have much to do in determining not only the severity of the disease, but also its duration and clinical features. We occasionally meet persons who seem to possess a natural immunity to the contagion, others in whom the disease assumes a mild form, even when not under the protective influence of vaccination or previous attack of variola. Since the introduction of vaccination, however, these modified forms of the disease have become far more common. In fact, at the present day with general vaccination in vogue, varioloid is not only the most common, but of the greatest importance to the physician, on account of its harmless appearance and the difficulty of maintaining strict quarantine regulations.

[2] Osler. Practice of Medicine, New York, 1896.
[3] Garceau, Vaccination Inquirer, Feb. 1887. p. 179.

For we must not lose sight of the fact that all forms of smallpox are essentially the same, and the source of contagion, whether it be from a mild, or a malignant case, affords no criterion as to the form the disease may assume in those exposed. Varioloid is therefore a mild form of smallpox usually occurring in those who have been vaccinated, or have previously had the disease. It is a fact commonly observed that vaccination protects against the development of the variola poison for a certain, though variable, period. Gradually the time arrives when the system loses the complete protective influence of vaccinia and, if exposure takes place, a mild form of variola develops. One attack of variola usually confers a life-long immunity to the disease.[4] After the lapse of many years, however, occasional exceptions occur. Thus it is commonly reported that Louis XV., of France, suffered from smallpox at the age of fourteen, and contracted it again when sixty-four years old, from which he died.

The most important time to recognize the disease is at the outset, and it is at this time that uncertainties of diagnosis are most liable to occur. During the past winter a good opportunity to study smallpox presented itself in Cleveland. In observing cases entering the Smallpox Hospital one was impressed with the fact that in many instances the disease was well under way before the patient was received. Upon inquiry it was ascertained that in most cases an uncertain diagnosis had occasioned the delay. It is also an unfortunate fact that a mistaken kindness—a too tender regard for the feelings of the patient and his immediate family—deterred medical men from reporting suspected cases. It is not strange therefore that in spite of the efforts of the health department the epidemic insidiously extended until its vic-

[4] According to Marson, Reynolds System of Med., vol. 1, p. 245, during the 119 years since the founding of the London Smallpox Hospital, not a single instance has been recorded of a patient being admitted with smallpox a second time.

tims at the present time may be numbered by the hundreds. Much controversy has likewise arisen as to the diagnosis of individual cases, because typical landmarks are sometimes found wanting. Thus it will be argued that the eruption is not one of variola because umbilication is not present; again that eruption does not develop in regular order from the shot-like indurations in the skin to vesicles, which remain from one to two days and so on to pustules which finally, as desiccation proceeds, form crusts. Again that the lesions are not met with on the palms of the hands or soles of the feet; or that the pocks collapse on puncturing with a needle, and finally that the whole process of development may occupy less than a week. These exceptional conditions prove extremely confusing, if we expect to find the regular order of symptoms as detailed in text-books under a typical case of *variola vera*. Yet all the exceptions mentioned above may be encountered and still the case be one of smallpox.

How then are we to recognize the disease and differentiate it from other affections to which it bears a striking resemblance? After an extensive study of the affection covering a period of 18 years, and embracing numerous epidemics in different countries where climatal conditions are at variance, the writer has formulated the definition of varioloid as previously given as the disease of exceptions. During the early part of an epidemic, or in sporadic cases, there are few physicians who might not be thrown off their guard and fail to recognize a mild form of variola. Especially is this the case when mild initial symptoms are followed by an eruptive stage in which but two or three lesions are present, as we have observed during the past winter at the Smallpox Hospital; again, when the eruption, likewise following the mild initial stage, goes through the various stages of development in quick succession, the whole process being completed within ten days or a fortnight. A case illustrating this point may be given in brief: During the early part of the epidemic of 1898-9, a case presented itself in which much

difference of opinion existed. It was of a mild type, the lesions were few and underwent rapid changes from papules to vesicles, and in the course of a day or two developed irregularly into pustules. These varied greatly in size, the majority being no larger than a lentil. They were most prominent on the trunk, where their transformation was the most rapid. On the sixth or seventh day desiccation took place, and the crusts dropped off a few days later, leaving slightly reddish, pigmented spots. No destruction of the skin took place. Acting on my diagnosis, this case was sent to the Smallpox Hospital. Seeing her three days later, the rapid changes that had taken place attracted my attention. On further inquiry it was ascertained that a sister, previously attacked, was suffering with confluent smallpox in the same ward, and from her fine photographs were secured for illustrating a work now under way. As neither of these patients had been vaccinated, it was evident that the disease was the same in each.

The second important feature to bear in mind is the character of the lesions themselves. The typical smallpox lesion is indurated. This feature appears early in the development of the pock and is the last to disappear. In anomalous smallpox or varioloid there may be many in which induration cannot be detected. In fact the most prominent lesions may be composed of small blisters containing either a clear serum or pus, which when punctured completely collapse, leaving no induration in the skin, and if the shrivelled epidermic covering be removed by slight friction a small denuded area will result. This resembles what is seen in varicella, and lesions of this kind cannot be considered as typical of variola. In all cases of variola however certain lesions will present the indurated appearance. Such lesions when punctured do not readily discharge their contents, but several punctures are necessary to evacuate them. After this is done friction will not cause denudation, but the pock remains as an elevated ragged lesion. When seen even after

the crust has dropped off, the areas previously affected in the active smallpox process will be slightly elevated with parchment-like induration.

The Initial Stage.—The symptoms of smallpox at the onset often simulate cerebral meningitis more closely than any other disease. Again the severe epigastric pains accompanied by obstinate vomiting have been mistaken for those from intussusception of the bowels. Curschmann[5] relates an instance in which a patient was sent to the hospital with what was supposed to be intussusception, which proved to be the initial stage of hemorrhagic smallpox, which proceeded rapidly to a fatal termination. Recently a case was sent to one of the Cleveland hospitals with severe pain in the abdomen, which was entered as appendicitis. Two days after the operation a diagnosis of smallpox was made. This is not given as an instance of mistaken diagnosis, for a gangrenous appendix was found and the previous history of the case led to its early recognition. Still, one should bear in mind the possibility of error. At other times, from the severe gastric disturbances during the stage of invasion, the ingestion of toxic substances has been suspected. The erythematous rashes, which so frequently accompany the first symptoms of variola, have led to the belief that one had to do with a mixed infection, which most authorities regard as extremely rare. We will now consider *seriatim* the various affections with which smallpox is most liable to be confounded.

Measles.—A possibility of error between measles and smallpox can occur only during the initial stage and the beginning of the stage of eruption. During the initial fever of smallpox, it has been shown that an erythematous eruption is not infrequently observed. When widely diffused and blotchy it may be mistaken for measles, to which it ofter bears

[5] Curschmann. "Small-Pox" in Ziemssen's Encyclopedia of the Prac. of Med. N.Y., 1875, Vol. II.

a close resemblance. In measles however the rash appears later, usually during the third or fourth day, and first shows itself as reddish macules on the face and upper part of the trunk, while these parts are the last to be involved in the prodromal rash of variola. Furthermore the catarrhal symptoms which are so prominent in measles are absent, or nearly so, in smallpox. On the other hand severe lumbar paisns are seldom encountered in measles. There is less likelihood of error during the eruptive stage. In the confluent form of variola however, mistakes have been made. It should be borne in mind that the lesions in measles are flat, soft and velvety to the touch, and when put on the stretch, give rise to no perceptible thickening of the skin; while the early papules of smallpox are indurated, small, and feel like duck-shot embedded in the skin. In measles the blotches develop by peripheral extension until they spread out to dime-sized areas, while in smallpox the process of development is, though deeper, more circumstribed and seldom exceeds a split-pea in size. Vomiting is not an infrequent symptom in both diseases, although it is more constant in variola. In both diseases blotches may be detected in the fauces. With the appearance of the eruptive stage the temperature rapidly falls in variola, while no remission is observed in measles. The prevalence of an epidemic or of other cases in the immediate vicinity, will sometimes facilitate in making a diagnosis, or at least put one on guard.

Scarlet-fever.—The prodromal rash of variola which counterfeits scarlatina is met with for the most part in mild cases, and is accompanied by little if any anginal symptoms. The premonitory symptoms are always severe in variola, while in scarlet-fever on the contrary, they are slight and may be entirely overlooked. The pulse in the latter disease is rapid and is out of proportion to the mild fever, while in variola the fever and pulse-lines run nearly parallel. In scarlet-fever the erythematous blush appears first on the upper part of the chest, cheeks or neck. In variola the scar-

latiform rash is best marked on the lower part of the abdomen and inner surface of the thighs. On careful examination one may often distinguish between the two from the rash alone. It is brighter in scarlet-fever, and of a dull-red in variola. Another distinguishing feature is the swelling of the cervical lymphatic glands so common in scarlet-fever and seldom if ever seen in an early stage of variola. The conspicuous papilla, or strawberry tongue, so constant in scarlet-fever, is absent in variola. Finally the age of the patient is often of assistance. It should be borne in mind that the prodromal rashes of variola seldom occur in young children, while adults seldom suffer from scarlet-fever.

Impetigo.—The differential diagnosis between smallpox and impetigo was ably presented to this Society two years ago by Dr Collamore, of Toledo. In this paper Dr Collamore details minutely several cases occurring under his observation in which the diagnosis was uncertain between the two diseases. A letter was recently received from Dr Probst, Secretary of the State Board of Health, bearing on the differential diagnosis of these affections. In this communication it was shown that the prevalence of supposed impetigo in several towns in Ohio had given rise to an undoubted epidemic of smallpox. During the past year while making a series of observations on impetigo and its various forms, especially the bullous impetigo, or the so-called *pemphigus contagiosus*, the subject of the differential diagnosis between smallpox and impetigo was again brought forcibly to mind. Although the instance has previously been reported, yet from its importance some of the main features will again be given. The case in question occurred on board the "*Yale*" on its way to Santiago, and upon the diagnosis depended the movement of the American forces during the late Spanish-American war.

The patient causing the commotion among the army and navy medical authorities was a native of Connecticut, who had been previously vaccinated, and to the best of his

knowledge had not been exposed to smallpox. Soon after embarking he was attacked with a bullous eruption, which extended over the entire body. It appeared without premonitory symptoms of any kind, and its presence did not affect the robust health of the patient. The bullas developed until they attained a size varying from a pea to a pigeon's egg, easily ruptured, leaving excoriated surfaces and a desquamative debris of epidermis. The case was pronounced by the ship's surgeon to be one of smallpox. The weight of this diagnosis was enhanced by the fact that the surgeon had had much experience with smallpox, having observed it in various climes. Dr Crile, of Cleveland, Staff Surgeon under General Garretson, who had charge of the brigade, was asked to see the case, and took occasion to differ from the opinion expressed, regarding it as a case of pemphigus. The patient, however, was suspended aloft, and an electric fan device was placed under his cot to drive the *contagium* away from the other passengers. Arriving at Santiago the case was seen by Dr Greenleaf, of General Miles' staff, who confirmed the diagnosis made by Dr Crile. The man was sent ashore, but the fort medical officer refused to admit him on the ground that it was a case of smallpox. At this time it is said some friction arose between the naval forces and the troops under command of General Miles, as to whether the fleet should be sent to harass the coast of Spain or continue their united efforts in Cuban waters. It was urged by the Naval Commander that the case being one of smallpox, the "*Yale*" and its passengers would have to undergo the restrictions of quarantine, hence it would be impossible to follow out the plan proposed. Happily, the recovery of the patient relieved the difficulty, and thus was averted a mistake which might have changed the history of the war.

During the present epidemic I have taken occasion to study the various conditions bearing upon its differential diagnosis with impetigo, and in two instances have found the similarity most striking. The first occurred during the

early stage of the disease, with few lesions present. The second, of which an admirable photograph was obtained, illustrates the tendency late in the course of variola to assume a bullous character. This is best marked on the hands, and to a less extent on the feet. It usually occurs about the twelfth or fifteenth day of the disease, and is due to secondary infection of the ordinary pus cocci, giving rise to a collection of serum under the epidermis surrounding the encrusted smallpox lesion. An intimate familiarity with the lesions in both diseases however would readily enable one to recognize either affection.

Chickenpox.—Unquestionably many errors occur in determining between chickenpox and variola. In fact in Germany, following the teachings of Hebra and maintained by Kaposi, the two diseases are looked upon as identical; while in England, France and America they are regarded as entirely separate affections. The subject has been so ably treated that I will not take time in pursuing it further, for it has been clearly demonstrated that the two diseases have nothing in common, save in the somewhat similar appearance of the eruptions.

Mild cases of variola, it is true, closely simulate varicella, and even the experienced diagnostician may for a time hesitate between them. Investigations which are now under way by Dr Perkins, of the Pathologic Laboratory of the Lakeside Hospital, have already demonstrated that the lesions differ as to histologic location, as well as in the manner of their formation. Thus the first changes in variola take place deeply between the epidermis and the papillary layer of the derma. In fact it may appear that the papillas are first attacked. In varicella the superficial strata of the epidermis are principally involved, and a serous exudate occurs at this point, resulting in a transparent thin-walled vesicle; while in variola the shot-like, deep-seated induration and subsequent vesicular formation are sufficiently distinctive to warrant a differential diagnosis. The lesions in

varicella, as a consequence, are easily destroyed, and when seen present a transparent, beady appearance, some of which having ruptured leave excoriated areas; whereas in variola it is impossible to rupture the lesions so as to evacuate the entire contents without numerous punctures or totally destroying the diseased area. But we must not lose sight of the fact, that in varioloid many lesions may abort, producing a mixed eruption, and the presence of pus cocci often further masks its true nature. Again as a rule variola presents more uniformity of development, papules succeeded by a whitened appearance, giving rise to pustules, followed by desiccation forming blackish crusts. In varicella on the contrary multiform lesions are the rule, papules, vesicles and pustules together with excoriated areas are observed at the same time. This is produced by successive crops of papules in the same region of the body, which are not observed to the same extent in variola. The duration and development of the lesions are likewise of importance. In varicella they are short-lived, an individual lesion seldom lasting more than a day or two; whereas in variola they go through a regular series of development and, excepting in abortive pocks, attain their maturity about the eighth day, after which desiccation and the formation of crusts follow. Usually a fortnight to three weeks completes the life-history of the lesions. In mild cases of variola, sometimes called spurious smallpox or varioloid, the time of development is shortened, and in these cases the greatest difficulty in diagnosis arises. But even here the multiform character is less conspicuous, as well as the successive crops of the eruption, and although the lesions may only last a week or even less, there will be found some which adhere to the type, and with close observation may be recognized with certainty.

Finally the age of the patient is important; the writer has never encountered chickenpox after puberty, and the consensus of opinion bears out the statement that it is essentially a disease of childhood.

La Grippe.—During the presence of influenza, such as has occurred in Cleveland during the past winter, most patients and not a few physicians have mistaken the premonitory symptoms of smallpox for "an attack of *la grippe.*" When in due time an eruption has appeared, they, like the ancient Greeks, have not considered the exanthem of sufficient importance to determine the name of the infection, hence have neglected in many instances the proper measures for limiting the spread of the disease. Reiteration is not necessary, for a careful consideration of the symptoms will remove any doubt that may at first exist. The importance of making daily visits in all suspected cases, especially during a smallpox epidemic cannot be too strongly urged.

Syphilis.—The first patient sent to the Smallpox Hospital after its completion was a negro suffering from syphilis. The appearance of both eruptions on the palms and soles, often so prominent both in smallpox and syphilis, sometimes renders their differentiation difficult. Adding to this the lesions on the mucous surfaces that occur in both diseases, the clinical picture may be doubly confusing. I recall a case in the Middlesex Hospital under Dr Liveing, in which experienced men differed in opinion between these diseases. A careful study of the case however will enable one to form a correct opinion as to its nature. The eruption on the palms and soles is always of diagnostic value, for while it occurs in varicella to a very limited extent, and is also present in syphilis, it never assumes the pustular character so prominent in the variolous eruption. That there is a distinguishing odor to variola, I have never been able to confirm; an equally extensive suppuration of the skin from other causes, with like inattention to cleanliness, will, according to my observation, give rise to the same nauseating stench.

Drug Eruptions.—Not infrequently during the past winter cases of suspected smallpox have presented themselves with an eruption which was ascertained to be caused by the

ingestion of cubebs or copaiba. Potassium iodid likewise sometimes gives rise to a pustular eruption which at first sight may closely resemble that observed during the eruptive stage of variola. In these cases an accurate history of the previous condition is important. The absence of all febrile symptoms, the odor of the drug, which may frequently be detected, will usually enable one to arrive at a correct conclusion as to their nature.

Finally in the differential diagnosis of smallpox the following points should be kept in mind: First: One should consider the possible sources of infection. This may not be easily obtained in isolated or sporadic cases, nor at the beginning of an epidemic. Second: In the eruptive fevers, whether or not the patient has previously had the one to which the symptoms most strongly point. This however should not be too strongly relied upon, especially in measles and scarlet-fever, although with them one attack is commonly known to confer more or less immunity to subsequent invasion. Third: The disease is most liable to be variola, when the most prominent symptoms are: Sudden onset of chills or rigors, severe headache, backache, and vomiting, accompanied by a rapid rise of temperature, with delirium, constipation in adults and diarrhea in children. Further, with the supervention of sweating, furred tongue, fetid breath and the appearance of an irregular erythematous or petechial rash, first appearing and best marked on the crural triangle of Simon.[6]

DISCUSSION

Dr D. N. Kinsman, Columbus: This paper has certainly been very interesting. There is one point which the doctor has not mentioned and I insist upon it here. I have

[6] This space is bounded above by an imaginary line drawn transversely across the umbilicus, which forms the base; the sides are formed by the lumbar regions, and the apex is directed downwards and corresponds when the knees are pressed together to a point situated about two inches above the patellas. Th. Simon, *Das Prodromalexanthem der Pocken. Archiv fuer Dermat. und Syphilographie.* II. Jahrgang, S. 347, et seq.

never seen a case of chickenpox in the adult, that I say positively. I have observed variola for more than thirty years. I have been continuously seeing cases of varicella and varioloid all these years, and I have never seen a case of varicella in an adult. This is the first point and the next is this, if you find a case of apparent varicella in the adult, you will find that you have a case of modified smallpox. The history in this state has shown all of these cases of so-called varicella in adults to be cases of modified smallpox. Up in Marysville they had two cases of varicella. The doctor in attendance told me they were such and I asked how old they were. He said that they were grown up and that they could be nothing else. In less than two weeks he had cases of confluent smallpox in that family. It is the duty of health officers to quarantine all adult cases of chickenpox.

The eruption of measles you can see in the throat long before it appears on the face. There is always the appearance of the dark-red eruption upon the soft palate and also upon the uvula which will precede by 24 hours the development of any other eruption in measles, and the association of catarrhal symptoms will enable you to say what you have got. There is also another symptom which develops before measles and that is a distinct white patch in a red papule on the inside of the mouth. Koplick relies upon this and says that it is the earliest of the eruptive manifestations which occurs as a prodromal symptom of measles. It is very curious about this matter.

Another thing which Dr Corlett mentioned in his paper. He insisted that you should study the location of the pock. Now the lesion of varicella is subepidermal, lying between the skin and epidermis, and in the other case the eruption is always in the skin. There may of course be modifications. We have seen hundreds of cases of smallpox and we do not have any trouble in distinctly marked smallpox, it is the anomalous forms irregular possibly in several of their manifestations, and we must be continually on the alert for these cases.

Dr C. E. Beardsley, Ottawa: This paper has been very interesting. It is only a short time since in our extreme northwest that there was a little friction between the doctors and the health officers in regard to smallpox—I see Dr Probst here and he will probably understand that. There

were some little discrepancies which came up in my mind in regard to the differential diagnosis, which Dr Corlett did not seem to bring out clearly; cases such as came to my notice which had much pain in the back before the eruption appeared.

Some years ago a German (from Ottawa) who had been vaccinated, and had the mark on his arm, went back to Germany, and when he returned he had an eruption on the skin which was called German measles. In a few days fifteen cases broke out with genuine smallpox. Can genuine smallpox be carried from an eruption of this sort, and from such individuals? Now remember, I will exclude the man's clothing in this case, because he had bought himself a new suit and he had thoroughly changed his clothes and it was certainly not conveyed by his clothing. He inoculated quite a number, and as we believe, from what was diagnosed German measles.

Another one of these queer cases comes to my mind in which we had quite an epidemic of smallpox started by a doctor having taken some vaccine matter from an eruption following a case vaccinated *with bovine virus;* with this vaccine matter he vaccinated quite a number who had similar vaccine eruptions on the arm, probably two or three large pustules, but others in the family broke out with smallpox, and one of them with confluent smallpox. Now there is this question in my mind which I would like to have solved by those who understand it. Probably Dr Probst can explain. Can smallpox be conveyed to other individuals by an eruption following vaccination, or from one who was vaccinated years prior to this eruption, which communicated smallpox as above?

Dr C. E. Probst, Columbus: I wish to make a few remarks on the diagnosis of smallpox. We have been having in the State an epidemic such as we have not had in Ohio for 40 years, and we are bound to have a great deal more of it before we are done with it. Just before leaving my office I was getting together some statistics as to the number of cases we have had since the first outbreak up to May 6, 1899. We have had in all 1,682 cases with but 24 deaths. During the present year, that is 1899, up to May 6, we have had 1,014 cases with but 19 deaths.

The wonderful feature of this epidemic is this remark-

ably low death-rate. It is hard to conceive of smallpox as we ordinarily consider it breaking out in four or five different communities without anybody knowing it, but that is just what happened in this State. They called it chickenpox and that is the reason why we are having so much of it in the State today. The disease spread practically all over the State of Ohio. Physicians are not much to blame for the mistakes in diagnosis which have been made this year. The descriptions in the books of ordinary attacks of smallpox did not fit the cases we have had this year at all; and what physicians have seen in previous years was in many points simply misleading.

Dr Kinsman's point is a most important one in the diagnosis of smallpox from chickenpox, this latter disease being one of childhood almost exclusively. Having this point in mind I have taken the trouble to make a few citations from authors with whom you are all familiar.

Osler says varicella is a disease of childhood, rarely seen in the adult. Keating says that varicella is a disease of childhood, rarely occurring in children over 10 years of age. Hyde says varicella is a disease of early life occuring almost exclusively in child life. Quain says that chickenpox occurs in childhood in increasing frequency upon four to twelve years. Bartholow says that chickenpox is a disease of childhood rarely occurring after 10 years of age. Thomas says it is a disease of childhood occurring very infrequently in children over 10 years of age and he has never seen varicella in the adult. There is an eruption occurring in adults resembling varicella, but it is always varioloid.

I have a complete record of 763 cases of smallpox occurring in our present epidemic. Of these 518 were adults, 66%.

The question of vaccination should always come into consideration in the matter of diagnosis of smallpox, but I find that it is not always inquired after. Of the 763 cases referred to, 714 were unvaccinated, or 93%. The question as to whether they have had chickenpox is rarely asked by the physician.

I have seen cases of smallpox where the eruption of previous chickenpox could be seen on the face. There was proof positive that the child had gone through an attack of chickenpox before.

The point concerning the superficiality of the eruption

of chickenpox has been noted. The eruption this year in smallpox has not been so deeply seated in the majority of cases as it has been in years past, so that patients have recovered from confluent smallpox, when the eruption covered the whole body, with but little pitting.

The question Dr Beardsley has asked in reference to vaccination causing the spread of smallpox I will leave for Dr Corlett to answer, though I would protest against such an assertion going out from here undisputed. Vaccination *prevents* smallpox, it never causes it.

Dr B. H. Blair, Lebanon: I have noted the positive statements of my friend on the question of smallpox. I wish to relate very briefly a case. A young man 17 years of age came into my office with a copious eruption all over the body and there was considerable induration in the eruption. He had no premonitory symptoms, had never been vaccinated, had never had varicella, and had at that time no elevation of temperature, but his pulse was slightly accelerated. Being in doubt as to the nature of the cause I had Dr Scoville who was the nearest and oldest physician within reach called in consultation and he was unable to positively make a diagnosis, but gave it as his opinion that it was a case of smallpox. I vaccinated the young man before he left my office and insisted on his being taken home and isolated, and I promised to call to see him. When I did call two days afterwards his father stated that he was not sick, and the eruption was beginning to disappear. In a few days after this the vaccination took in the usual and regular form, and if there was anything different, it was rather an unusually severe case. There were no cases of varioloid or varicella developed in that community. The question is, what was it, varicella in an adult, or was it varioloid? And if varioloid would the vaccination have taken and have pursued a normal course?

Dr Bennett, of Daytona, Fla.: There is one point in connection with smallpox which I have not heard mentioned here. When we come to the door of a cabin where they have some disease of this kind we meet an odor, and we say before we see the patient whether it is smallpox or measles. What that odor is the English tongue is not sufficient to express.

In regard to umbilication, I think that the gentleman

who reports a case of smallpox with no umbilication is lax in his investigation. I would rather believe that there was an umbilication and that he did not see it.

In regard to the point made, that you may vaccinate one in a family and from it have two cases of true smallpox arise, the logic is not good. Those two people got their smallpox from some source or other, but not from vaccination, and the history is not given. The idea ought to be very well expressed here that by vaccinating one in a family you do not give them smallpox. You might just as well say that the three persons might have had it but for the vaccination of the one party.

Dr G. W. Crile, Cleveland: I would like to say a word in reference to the case Dr Corlett referred to in connection with appendicitis. I happened to operate upon that case. The patient had a history of feeling a little malaise on Sunday, on Monday returning to her work. She felt badly on Monday evening, and on Tuesday distinguished pains in her right side. She sent for her physician and he diagnosed the case as appendicitis and recommended operation. On Wednesday another physician was sent for and he diagnosed the case as appendicitis. On Tuesday her temperature was 103° and on Wednesday 104°. It was noticed that the constitutional symptoms were very much out of proportion to the local symptoms and the indications for operation seemed to be very marked. Fortunately for me there were present six physicians who could bear out the diagnosis. The appendix was gangrenous and was shown to all the physicians who were present. There was cicatricial stenosis from previous attacks. The case was an extremely interesting one because we were very much impressed with the previous constitutional symptoms and did not have the slightest idea that we had to deal with a case of smallpox, but on the second day after the operation the disease developed and Dr Corlett confirmed the diagnosis of smallpox. The patient was at once isolated and the place quarantined.

Dr Gustav E. Zinke, Cincinnati: Before the gentleman makes his closing remarks I would like to ask a question, and that is to give us his differential diagnosis between *purpura hemorrhagica* and smallpox. I do not pretend to deal much with smallpox although I have seen in my time a great many cases. I have recently confined myself to a

specialty, but because I was previously in general practice I am very much interested in these cases. In 1892 I was called to see a woman in a German family living at Bond Hill who had just returned from Germany where they had spent six months. When I saw the patient she had an eruption around the neck and chest which was distinctly hemorrhagic in character. There was no elevation of the skin whatever, and she had had a previous bleeding from the nose. Her temperature was 103½° and her pulse 120.

She was an excessively fleshy woman. Not being familiar with skin diseases I gave a description of what I had found to Dr Ravogli, and asked him if he did not think that it was a case of *purpura hemorrhagica*, and he said in his neat way of expressing himself: "You had better be a little on your guard. Has that lady been exposed to smallpox?" I said that I did not know, that I had not inquired into that. Because of the character of the discoloration, with no elevation of the skin, I could hardly get myself to believe that that would turn out to be a case of smallpox, but after 48 hours this patient had broken out all over her body and she had a beautiful case of confluent variola. She died promptly, and that case was succeeded by an epidemic in that neighborhood which lasted for about a year.

Dr Wm. Thos. Corlett, Cleveland: Dr Kinsman has emphasized a very valuable point in the differential diagnosis of smallpox, namely when in doubt between variola and varicella, bear in mind that the latter is essentially a disease of childhood. Dr Probst, whose wide experience renders his opinion especially valuable in this connection, likewise confirms this statement. In my own experience chickenpox has never been encountered in children over 15 years of age. This is likewise the experience of Dr Graham of Toronto. Curschmann whose extensive observation in the hospitals of Lausanne enables him to speak *ex cathedra* on this question says, in the case of an adult when in doubt between smallpox and chickenpox, it is always smallpox.

As to the second point brought out by Dr Kinsman I wish to say that the mucous membranes of the mouth and pharynx are very early involved in nearly all eruptive fevers. We see it especially prominent in syphilis. In measles it has always been recognized, although there has been an effort of late to make it appear in a new diagnostic role. This

reminds me of someone's method of flushing the posterior urethra, as if no one had been in the habit of flushing out the posterior urethra until somebody wrote an article on the subject a few years ago. The careful inspection of the buccal and pharyngeal mucosa is of importance in suspected variola as well as in various other diseases.

I regret not to have distinctly heard the first remarks of Dr Beardsley, but I think it was in regard to neuralgia as an early symptom of smallpox. It has not occurred to me that neuralgia is especially common early in smallpox, although we know that the nerves are not infrequently involved late in its course, or as a sequel. Pains occur in all parts of the body early in the disease and in a study of 200 cases I recall but two in which they were sufficiently distinctive to be called neuralgic.

Dr Beardsley's second observation has been so ably answered by my friend on the right that further discussion at this time seems unnecessary.

A word in regard to the umbilication in the smallpox lesion, which I believe a very important thing to understand fully, because it is so liable to mislead. As the vesicles develop umbilication is common, although not invariably present, later in the early stage of pustulation the lesions are likewise frequently umbilicated. Still later however as the walls of the pocks become tense and the contents of the pustules increase all trace of umbilication frequently disappears. If then you are called to see a case early in its course the appearance as to umbilication may be quite different from that observed later after the pocks have matured. In varioloid but few lesions as a rule present any marked umbilication and more frequently it is wholly absent.

One hears so much about the odor arising from smallpox patients that the question may well be asked, is there a special and distinctive odor? I would unhesitatingly answer no. This is not without careful and repeated tests, for the subject has so frequently been brought to mind that one could not well avoid comparisons. Any condition involving a like extent of integument accompanied by extensive suppuration will give rise to an equally nauseating odor. Add to this the insanitary surroundings so frequently encountered in smallpox and one may readily become convinced of the truth of this statement.

SOMETHING ABOUT PHAGOCYTES

D. N. KINSMAN, M. D., COLUMBUS

The blood has been studied for a long time. The old physicians who used the lancet freely, carefully examined the coagulated mass of blood which had been drawn from their patients, as to the extent of the "buffy coat" and its contraction or "cupping." When these phenomena were absent, the blood was described as "sizy." Indications for treatment and prognosis were deduced from these signs. For a long time it was known that there were red and white corpuscles in the blood. A half-century ago it was discovered by Bennett and Virchow that the white corpuscles might increase to an extraordinary extent, indeed that they might become the chief factor in a fatal disease now known in several varieties. Then Virchow claimed a place in pathology for the leucocytes.

It was left to the last decade to show by means of stains that leucocytes were not so simple as they formerly appeared, but that they existed in several forms which could be readily differentiated by the relation of the protoplasm to the nuclei, the shape of the nucleus and the presence of acidophile, basophile, or neutrophile granules in or upon the protoplasm. They have a motion which has been called ameboid—from its resemblance to the motion of that unicellular organism, the ameba. They are known as small and large lymphocytes, polymorphonuclear, myelocytes, eosinophile, and mast cells. Two of them, the large lymphocyte and the polymorphonuclear, are phagocytes or devouring cells. It has been observed that these phagocytes can flow around or engulf blood and other cells, bacteria and inorganic matters, both solid and in solution, and thus act as scavengers of the blood. Their numbers vary greatly in the blood. They increase rapidly in number to even ten times the normal in

a few hours and hyperleucocytosis is produced. When their number is reduced below 5000 per c.m., the condition is called hypoleucocytosis.

Metschnikoff and his pupils have erected a theory of immunity and inflammation upon the activity of the phagocytes; his definition of inflammation is "the phagocytic reaction of the organism against infection or traumatism," which states his position in regard to both immunity and inflammation.

Our notions on infection and contagion are very hazy if we may trust most definitions. It would be in the interest of scientific thinking if we could eliminate the word contagion and use the word infection only, for it comprises all forms of germ-disease communication. We define infection as the reproduction of the germs in the organism, the symptoms which follow are the evidences of this infection. Immunity is a state in which the organism reacts uniformly and successfully against the multiplication of the morbific germs therein without symptoms. We may assume that all persons who are in the presence of a case of measles take the germs into their bodies. Some always escape after such exposure. Some take the disease. The first are immune, the germs cannot multiply in them, they do multiply in the other class, who become infected. In the immune there is no obvious reaction but the germ has been removed or destroyed. In the unprotected there is a reaction which is marked by fever, leucocytosis, etc. It may be urged that leucocytosis does not occur in all infections. The doctrine of positive and negative chemotaxis is offered for the solution of this difficulty; *i. e.* the germs may be so virulent as to repel the leucocytes and prevent their engulfing them. This is known as negative chemotaxis. When no such repulsion of the phagocytes exists, but they can engulf the germs or poisons, this is called positive chemotaxis. One attack of some diseases confers solid immunity. In other diseases the state of immunity is temporary or nil but

because of this state of affairs the action of the phagocytes in bringing about a recovery cannot be ignored. Immunity may be conferred by the use of "vaccines" or weakened bacteria, as in rabies or by an unknown modification of the germ, as in the case of vaccine against smallpox. The German school insists that immunity is due to substances contained in the serum of the immune animal known as "alexins," etc. The school of Metschnikoff holds that the modification of the serum of immune animals is due to cellular action, that the phagocytes make a direct attack upon the morbid germs when they enter the body, and that they engulf and digest the disease germs as well as produce the *alexins.*

Werigo, having counted the number of leucocytes in a cubic millimeter of a rabbit's blood, injected an inert powder in fine division into a vein of its ear. There was an immediate increase of leucocytes in the blood which enclosed the foreign matter and conveyed it to the liver and spleen, where these burden-bearing leucocytes were found in a few minutes after the injection. Leucocytosis continued some hours until the blood was completely scavenged. When tubercle bacilli are injected into a vein the mobile cells of the walls of the capillaries seize the bacilli and fix them; they are also to be found in the phagocytes.

It has been shown that the phagocytes digest bacteria and thus inhibit their production. It has been observed that in certain very virulent infections, for example in peritonitis of the severest type, that the phagocytes do not escape from the vessels into the cavity. This is an example of negative chemotaxis. In most infectious diseases there is increased leucocytosis, in others there is none. Among the infectious diseases in which it is absent we mention typhoid and malarial fevers without complications. But it has been abundantly proven by Besredka and others that leucocytosis and phagocytosis do not run in parallel lines.

In healthy blood according to Cabot, the large lymphocytes comprise from 4% to 8% of the leucocytes. The

polymorphonuclear from 62% to 70%; small lymphocytes 20% to 30%. Eosinophiles, ½% to 4%. "Mast cells" ¼% to ½%.

Steinon, quoted by Besredka (*Annales de l'Institutes Pasteur*, 1898, page 307), says: "In the first stage of typhoid the polymorphonuclear cells pass 80% and sometimes reach 90%." In diphtheria leucocytosis is excessive but Besredka has shown when doses of toxin sufficient to cause death are given, that after an increase for a few hours the polymorphonuclear cells rapidly diminish till death.

In slow intoxications the number of polymorphonuclear cells is diminished below normal, while the mononuclear cells are increased several fold. When an animal has been injected with a large amount of toxin, followed by the antitoxic serum, the animal recovers as the number of phagocytes rise in number. In any given case of diphtheria when the polynuclear cells are below 50% the prognosis is bad; on the other hand the prognosis grows more favorable as the percentage of polymorphonuclear cells rises above that figure. It has been urged against the Metschnikoff theory that the phagocytes can only remove inert matters, cells and dead bacteria, but are powerless in the presence of live bacteria and poisons. The fact that bacteria reproduce in white cells at times, shows they act on living bacteria, and the fact that they take stains badly after they are enclosed, shows they undergo changes in the cells. On this point Besredka has written a memoir, which has established beyond question that the phagocytes are active agents in ridding the organism of poison. (See *Annales de l'Institute Pasteur*, January and March, 1899.)

By injecting fatal doses of arsenic into animals he always induced hypoleucocytosis; *i. e.*, negative chemotaxis. In nonfatal doses there was hyperleucocytosis; *i. e.*, positive chemotaxis. When the blood was removed from the animals during the hyperleucocytosis, and centrifugalized,

and the leucocytes, red corpuscles and serum of the blood each tested for arsenic, the leucocytes alone gave the reaction, which shows that they remove it from the organism. When he injected the tersulphuret of arsenic, which is a red pigment, it could be recognized in the phagocytes for ten or twelve days, when it disappeared, showing it was soluble in the phagocytes. Here in one series of experiments we have demonstrated the power of the phagocytes to remove from the living organism both solid and soluble poisons; also that the phagocytes within certain limits resist the action of poisons. Incidentally we may remark that Gengou has shown experimentally that unicellular organisms resist the action of toxins. Here is another unsuspected support to the theory of evolution, in the survival in the phagocytes of the power to resist poisons, which they hold in common with unicellular organisms.

How do the phagocytes react against traumatism or infections? We know that the epithelia of the capillaries are mobile to a certain extent and that when bacilli are injected into the vascular system they lay hold of them and engulf them, and that this process is primary in the formation of tubercles.

As the phagocytes act in the presence of inert powders, as shown by Werigo, or in the presence of poisons, as shown in the presence of arsenic, so they act in the presence of bacilli and their toxins even in cases where there is no leucocytosis, as shown by Steinon in typhoid. The fact is, that without differential count of a field of leucocytes, any inference resting on the total leucocytosis is of little value except as a diagnostic datum.

The migration of the leucocytes in inflammation was known half a century ago, but it was left to Metschnikoff to insist upon its importance, both as a defense and as a factor in producing immunity. He traced the phenomena through the whole organic kingdom from the unicellular organisms to the most complex, and made the world acquainted with a very interesting biologic fact.

GASTRIC DISORDERS PRODUCING CONSTIPATION AND DIARRHEA

JOHN P. SAWYER, M.D., CLEVELAND

The experience of physicians in active practice includes numberless examples of disturbances of digestion, whose explanation depends upon a recognition of the intimate relationship existing in anatomic structure and physiologic function between stomach and intestine, into which relationship pathologic conditions enter to the fullest degree. The relationship is surely a reciprocal one, and in a given case the disturbance of either stomach or intestine may be due to the preceding disturbance of the intestine or the stomach respectively in that case.

I wish to leave to one side the discussion of the influence of a disturbed intestine upon a stomach in itself not the prime seat of disorder, and draw attention for a few minutes to conditions in which intestinal function suffers derangement with no other exciting cause discoverable than disordered digestion in the stomach, the recognition of which gives a reasonable indication for treatment.

In a large number of cases I have found in the investigation of the stomach-contents the key to the successful handling of an obstinate constipation or diarrhea, as described by Oppler in Breslau, and in our own country by Einhorn in New York. The subject as handled by these men finds recognition in the latest special text-books, but by no means in the degree which its practical importance seems to me to warrant. Because of the considerable number of cases which I have found, I have chosen to bring this subject before this society.

Let us take up first the consideration of those cases of chronic diarrhea which are due to this condition. I shall briefly relate a typic history.

Mr. K., age 62, referred to me because of a chronic diarrhea which had lasted since early September to February 9, when I first saw him. Without apparent cause the movements of the bowel began to be frequent, watery or pasty, with particles of food unchanged by digestion, of very offensive odor, usually two or three stools each morning—the first immediately on rising, without pain. There was marked anemia; the chest organs were normal; the abdominal organs were normal as regards liver, spleen, and kidney; the position of stomach was normal, but a slight atony seemed probable, inasmuch as succussion was easily produced. A succussion sound was easily obtained over the large bowel also. The arteries were slightly atheromatous; the pulse was 60, and slightly irregular; there were no edemas; the urine contained neither sugar nor albumin, bile-pigment nor indican. The test-breakfast showed a complete achlorhydria, and a total acidity of only four. The patient was directed to avoid all meats, and to get his nitrogenous food-stuffs from milk and egg, and their various preparations in *blanc mangcs*, custards, omelets and creams. Gelatin foods were also allowed. Starchy vegetables were directed, such as corn and wheat in ground form, rice, noodles, maccaroni, and the patient was directed to avoid vegetables containing tough fibers, such as cabbage, cauliflower, spinach, beets, turnips, parsnips, celery, lettuce, radishes, etc. Rest after meals was directed. Four days later, February 13, the patient reported that his bowels moved in a completely normal manner. He slept better, felt stronger, and had gained two pounds. March 17 the patient reported himself heavier (150 lbs.) than in twenty years. The bowels had moved naturally since his last report. His appetite was keen, and he had taken no medicine whatsoever.

This case is an example of a type which is continually recurring and which is important in practice, because it is especially stubborn in resisting the ordinary measures—astringents and the so-called bowel antiseptics. These cases

are usually controlled by drugs only when opium is given, but while this brings symptomatic relief, its continued administration increases the difficulty.

The rational handling of these cases is only possible when, other causes for the diarrhea not being found, investigation shows a failure of the function of the stomach, although there be no complaint whatsoever from the stomach itself. This is particularly true in those cases in which motor insufficiency of the stomach has not supervened to bring its quota of discomfort to the patient, in the colicky pains, sense of load, and distress after meals. Many of these patients have badly decayed teeth, and have failed to provide themselves with artificial substitutes. Many have accordingly passed through a chronic gastritis to atrophy of the mucosa.

But the diarrhea may result from the excessive acidity of the stomach-contents as well as from the commonly found condition which I have described. In a considerable number of cases which are not as constant in their manifestations of typic symptoms as in the group just described, the discharge from the stomach into the bowel of excessively acid material produces a catarrhal process, a true enteritis, whose phenomena are somewhat as follows: An hour or two after eating there will be, without sense of load or distress in stomach, an uneasy discomfort in the bowel with colicky pains, shortly followed by two or three profuse watery movements, in which there may be recognized portions of vegetable foods as taken. The movements are usually painful, and occasionally, when frequent and long-continued, will contain considerable mucus streaked with blood. Weakness, loss of flesh and loss of appetite supervene. Investigation of these cases, which usually come after the difficulty has lasted one, two, or more weeks, will show in many subjects entirely negative physical findings until the examination of stomach-contents shows an extreme hyperacidity in which the hy-

drochloric acid will ordinarily rise as high as from 1 to 2%, and the total acidity reaches 100 to 140. These cases are apt to be complicated with an acute catarrhal icterus. The adjustment of diet by exclusion of vegetable foods in any large proportion, and the administration of alkalis in suitable dosage, with the careful use of lavage if there be motor insufficiency of the stomach, suffice usually to promptly check the diarrhea, and bring about a better nutrition, and to hasten considerably the course of the catarrhal icterus should it be present.

A more common case however is that constipation results from the existence of hyperchlorhydria. Why an excess of hydrochloric acid produces results as diverse as diarrhea and constipation is not yet clear, but the clinical observation is too positive to be put to one side. I have examined many cases, of which as types I shall only detain you with the following:

In a paper read before the Cuyahoga County Medical Society I reported three cases of young men just returned from camps in the south, with the diarrhea which was there prevalent, with loss of flesh ranging from twenty to forty-five pounds, and in enfeebled muscular condition. In all of them the test-breakfast showed a total acidity of stomach-contents from 112 to 124, and the hydrochloric acid was markedly increased, reaching 1.1% to 1.7%. There had been no vomiting or pain in the stomach, but the symptoms were those of diarrhea and the ordinary discomforts associated with such a condition. A prompt betterment followed the free use of an alkali and the regulation of diet to the existing hyperacidity. There was no motor insufficiency in any of these cases. One of them developed the catarrhal icterus above referred to.

On the other hand I would relate the case of a young man 27 years of age, otherwise in good health, who came complaining of constipation, with headache, slight loss of appetite, and a loss of weight of twelve pounds within four

years. There was some slight tenderness in the right ileocecal region, and a slight degree of gastrotopsis. There was some slight atony of the stomach as shown by the easy production of succussion three hours after a meal. Test-breakfast showed a hyperacidity, hydrochloric acid 1.1%, total acidity 84, and moderate motor insufficiency. The constipation has been most stubborn, and the physician who referred him to me stated that he had used many combinations, but had been wholly unsuccessful in obtaining relief. A diet-list excluding food-stuffs stimulating excessive gastric secretion, a prescription of sodium bicarbonate and sodium phosphate, ten grains each at a time, was given, but the latter proved to be unnecessary. Some weeks later the patient reported that he had had no constipation while he followed out the diet prescribed, which had been determined by the existence of the hyperacidity. Occasional doses of alkalis had been necessary, but no other means had been taken to secure regular natural movements, and the patient reports he is in excellent condition in this respect.

The limits of this paper do not permit the detailed discussion of the diet-list, choice of various articles, the foods and their methods of preparation, or the frequency with which they should be taken. It is not possible to enter into the discussion of other forms of constipation and diarrhea, but I cannot too strongly urge upon your attention the advantage of recognizing in the conditions described the possible causal importance of departure from normal secretory and motor function of the stomach. In a very considerable number of cases drugs will be wholly unnecessary, or at least of minor importance, if the diet is adjusted in accordance with the findings in the case as to the secretion of the stomach. In this way only do we effectively recognize the fact, that a large part of the stomach's work is the preparation of foodstuff for the more active intestinal process. And in this course is a ready

and successful treatment for some of our most trying and, under other methods, most disappointing cases.

DISCUSSION

Dr L. B. Tuckerman, Cleveland: I want to emphasize the importance of the subject spoken of by Dr Sawyer, and also the importance of every general practician accustoming himself to the examination of the stomach-contents. It is not a difficult thing to give the test-breakfast and test the contents for its acidity and the amount of hydrochloric acid present. I speak of this matter because the Doctor has taken the conceit out of me. An occasional patient of mine, for whom I had been called on at night now and then to treat for attacks of acute palpitation (he was not a regular patient of mine) dropped into my office and said, "Doctor are you familiar with pumping out the stomach?" "Well," I said, "I am familiar with it." He then told me that Dr Sawyer had pumped his stomach out and that the Doctor had cured him. What did he give this gentleman? Nothing but a little magnesia. Now I want to say, gentlemen, in that case it had not occurred to me from careful physical examination that it was necessary to examine that man's stomach-contents. Dr Sawyer did so and got the credit of curing the case and I got the discredit of overlooking a condition I ought to have recognized.

Dr Sawyer: I have nothing special to say unless it is to emphasize the importance of the examination of the stomach-contents. It is as simple as the testing of the urine for acidity, to test the stomach-contents for the presence or absence of hydrochloric acid. This of course would be a qualitative and not a quantitative test. Congo-paper dipped in the filtrate will easily establish the acidity due to HCl.

Dr Tuckerman: If the time will permit I have all the materials here necessary for the test for total acidity and I would like to ask Dr Sawyer to show the members how readily the thing is done.

Dr Sawyer: Dr Whittaker showed this thing before the members of this society, and I will ask Dr Tuckerman to show his apparatus to you.

Dr Tuckerman (exhibiting the test): I had an idea that

Dr Sawyer was going to test the thing himself. I will use urine in this case and it will answer just as well as the stomach-contents, as the quantitative and qualitative tests are practically the same in both cases. Take a 1% solution of Phenolphthalein in alcohol and drop it into the beaker containing 10 c.c. of the fluid to be tested and if it does not change color the solution is acid. Drop from a buret a decinormal sodium hydrate solution and when the color changes in the beaker you have determined the total acidity. This urine is acid 100. You can see from this that the testing of the urine or the stomach-contents for total acidity is almost as quickly done as testing by litmus-paper for the mere fact of acidity and it ought to be done a great deal more often than it is.

Dr Sawyer, closing: I would only say that this test does not determine the quantity of hydrochloric acid present. All acids are indicated by this test and it is not for hydrochloric acid alone, and therefore we do not know from its use whether we have mineral or organic acids which are formed in fermentative processes. In the matter of urine it is of great importance that preservatives be mixed with the urine, or that the urine be tested immediately on passing, because the ammoniacal change will affect the test very much if it is allowed to stand any length of time.

VERTIGO

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We are wont to devote ourselves in our medical societies to the consideration of the unusual in clinical or pathologic aspects. But it is often not without gain to discuss conditions of disease with which we meet most frequently. This paper will treat of one of the most common nervous manifestations—vertigo. It will be devoted chiefly to a study of the nature of vertigo, or rather its proximate causes, and only briefly allude to clinical forms and their treatment.

The term vertigo has been given in times past to diverse manifestations and is even yet sometimes loosely

applied. Today what is usually expressed by the term is that visible objects appear to be moving (objective vertigo), or the patient feels as if he himself were moving (subjective vertigo), or both. That mere vertiginous sensations, "light headedness," a sudden sense of darkness, a sense of unsteadiness or insecurity, and the like, are of the same nature, is indicated by the fact that these milder sensations often continue to be present after a severe paroxysm has subsided, as well as that either the milder or severer sensations may be artificially produced by applications of the galvanic current to the head, according as a lesser or greater strength of current is applied. Other symptoms must be looked upon as a part or accompaniment of an attack, such as tinnitus, deafness, nausea, vomiting, cold perspiration, faintness, mental confusion, occasionally even momentary loss of consciousness, and not only a sense of movement, but also actual movement of the patient. A sense of fright or even terror often seizes the patient with the onset of the attack, which completely bewilders him and makes accurate observation of his subjective state impossible. At the same time there can be no doubt that much that is called vertigo does not really belong to this category of symptoms. Doubtless this is true of many attacks of transient loss, or blunting, of consciousness and of some subjective sensations spoken of as dizziness.

Vertigo is usually interpreted as a consciousness of disturbance of the position of the body or of the sense of equilibrium. Therefore we are called upon in this study to consider the subject of equilibration and of the sense of the position of the body in space. The limited time allotted compels me to be very brief in my remarks upon this subject. The spatial sense, or the sense of spatial relations, is the result of sensations received from the skin, muscles, eyes and ears. All the sensations are received and coordinated in some subcortical center of the brain, believed to be the cerebellum. This subcortical center in its turn directs and

controls the action of the muscles which maintain the body in its appropriate position. This action of the subcortical center is accomplished without the guidance of the cortical centers, for equilibration is usually an unconscious and automatic act. At the same time the highest cortical center is in relation with this subcortical center. It is very likely that equilibration, though an automatic act, was in the beginning directly under the control of the cortical center, and only after long practice became automatic; and even now it may at any time come to the cognizance or under the direct guidance of this center.

Disturbance of any part of the mechanism of equilibration, of the afferent or efferent nerves, or of the respective brain-centers, will cause disturbance of the equilibrium of the body. Nevertheless disturbance of any part does not necessarily produce vertigo. For instance loss of tactile and muscular sense in locomotor ataxia causes impaired equilibration but not vertigo; the same is true of ataxia from destruction of the efferent nervous tracts; and even disease of the middle lobe of the cerebellum, whilst it produces a reeling gait, may not be attended by vertigo. As far as the peripheral mechanism of equilibration is concerned, only the ear and eye appear to be directly related to vertigo, and I shall now enter into a more careful study of that relationship. The questions to be considered are as yet by no means definitely answered. In proof of this statement I may mention that Gowers affirms that 90% or more of the cases of definite vertigo are due to disease of the labyrinth, whilst Mendel has recently attempted to show that vertigo is nearly always an expression of disturbance of the apparatus of the ocular muscles.

Since the experiments of Flourens, repeated by many others, it has been generally believed that the semicircular canals in the temporal bones are a chief part of the mechanism of equilibration—the balancing organs as it were. Ap-

parently each of the three canals has its special functions relative to movements in its own plane.

The relation of the semicircular canals to vertigo is seen in the effects of disease of the ear, especially the internal ear. I cannot present this relationship better than by quoting from a recent article of Adler's,[1] in which he reports a number of cases of his own and others, which have almost the clearness and force of physiologic experiments. His own were all cases of injury to only one labyrinth, in one instance due to fracture of the temporal bone, in several instances to wounding of one of the canals during surgical operations, in still others the lesion being the result of inflammation. After the subsidence of very severe manifestations in a few instances the following observations were made in all of them. There was no vertigo during absolute rest nor when the head was bent or turned toward the sound side. There was vertigo whenever the head was bent or turned toward the side of the lesion. This vertigo was both subjective and objective—the sensation of both the person's self and visible objects moving—the apparent movement being toward the affected side. In some instances there was also actual movement of the patient, especially whilst standing or walking, that too being toward the affected side. The sense of movement seemed to be controlled by the special semicircular canal affected by the exciting movement, for it appeared to be in the same direction or in the same plane as that in which the head was moved.

Adler quotes two cases reported by Guye, well worth repeating in this connection, though such experience is possibly not unfamiliar to aurists. In the first, a man of forty-nine with disease of the left middle ear and an opening into the mastoid cells, injections of water into the latter always produced a feeling as if the patient were turning on a vertical axis toward the left. In the second case, a girl of sixteen with severe inflammation of the left middle and internal ears,

[1] *Deutsch. Zeitsch. f. Nervenheilkunde*, vol. xi, p. 358.

a sudden inflation of the middle ear with air by the Politzer method, was followed by a quick, unexpected movement of the head toward the right. At the moment of inflation the patient had a feeling as if the head were moving toward the left. She was not aware that there had been an actual movement in the opposite direction, a movement, doubtless purely instinctive, made to overcome the supposed movement to the left.

As further proof of the relation of vertigo to the labyrinth, I will add the familiar facts of vertigo produced by the application of the galvanic current to the head. It is produced the more readily the nearer the electrodes are applied to the ear, especially when the current is applied transversely through the head. It is usually observed of this artificial vertigo that the apparent movement both of visible objects and of the individual's self is toward the negative pole. Hitzig states that the subject tested with the current falls in the opposite direction—toward the positive pole. But in such instances those who accurately noted their sensations stated that their feeling was that they were moving toward the negative pole, so that the actual fall must have been from an instinctive and unconscious movement, such as that in Guye's second case.

A word of explanation of the vertigo from labyrinthine disease. Vertigo probably occurs when a given position of the head is not associated with the usual muscular sensations sensations which in this instance, are chiefly from the labyrinth. Normally when the head is at rest, the fluid in the labyrinth is also at rest. When the head is moved the pressure of the fluid in the labyrinth upon the ampulla (wherein are the nerve-endings) of the special canal which is in the plane of movement tells the exact position of the head, so that there is a constant correspondence between the sense of the position of the head and the muscular efforts necessary to keep it there. But in case of disease of the labyrinth (or the middle ear) irritation of the ampullas gives

rise to the same or even stronger sensations as are produced by movements of the head, and there arises a false feeling of its position, and consequently a discord between the sense of position and the muscular effort to keep it there; possibly a discord between the sense of position afforded by the labyrinth and that afforded by muscular and other sensations. This discord must be the cause of vertigo, or rather vertigo is its expression. That in Adler's cases the vertigo occurred only when the head was turned toward the lesion must have been because only such movement increased the irritation in the nerves of the ampullas.

That ocular troubles may cause vertigo has long been known, as well as that subjective and objective symptoms on the part of the eye are among its prominent manifestations, but Mendel[1] has recently formulated the theory that the proximate cause of vertigo is nearly always in the apparatus of the ocular muscles. This view, not altogether new, is put forth with great force. He states that, inasmuch as the manifestations of vertigo are alike, whatever the disease that produces it—disease of the eye, ear, stomach, atheroma, toxic conditions, etc.—the proximate cause must be the same in all. Then he brings an array of facts to prove that this cause is, as just stated, in the apparatus of the ocular muscles. The most important of these facts are the following:

1. Subjective eye-symptoms are part of the attack, such as that the patient cannot fix objects: everything appears dark; objects appear to move upwards or downwards, or to the right or the left, or toward or away from the patient, or to whirl about, etc.; more rarely there is double vision. The vertigo usually begins with some of these eye-symptoms.

2. Objective ocular symptoms are not rarely noted in the attack, such as dilatation of the pupils, ptosis, strabismus, nystagmus. They too may occur at its very beginning.

[1] *Berliner klin. Wochensch.*, 1895, p. 557.

3. Diseases of the eye are often the direct cause of vertigo, such as hypermetropia, astigmatism and paralysis of the ocular muscles. In case of the latter the vertigo sets in with the onset of the paralysis; vertigo is sometimes the first symptom of *ophthalmoplegia externa.*

Such observations led Mendel to investigate whether there was any reason why the eye-apparatus should be specially sensitive to disturbances which bring on vertigo. He had a careful examination made of the vascular supply of the pons, medulla, etc., from which it was found that the arteries supplying the nuclei of the nerves of the ocular muscles, especially the nucleus of the third nerve, were very fine, and at the same time end-arteries—that is that each artery did not anastomose with any other, not even with that of the same nucleus on the other side. These vessels were given off from the larger arteries at a point where the force of the blood-stream was least and most easily lowered by disturbing influences; and finally they were given off from those larger vessels at an angle that tended to lessen the force of the currents in themselves. Mendel believed that the results of this investigation justified the conclusion that no other part of the brain was under such unfavorable conditions of blood-supply as the part just under consideration. Hence every disturbance of the cerebral circulation is likely to be felt here first, and we can understand the readiness of the occurrence of vertigo with hemorrhages, with sudden movements of the head, sudden rising from a stooping position, in anemia, toxic conditions, brain lesions, etc. This ready explanation of the occurrence of vertigo seems to add to the probability of its accuracy. It seems in other words to be a confirmation of Mendel's views. At the same time Mendel disbelieves the relationship of the labyrinth to vertigo. He discredits the deductions, drawn from the long list of experiments from Flouren's down, that the labyrinths are the balancing organs, believing with Baginsky that the results of experiments were due to the escape of cerebro-

spinal fluid from the labyrinth, and consequent changes in the cerebral circulation, and not directly due to the labyrinth. Even the vertigo of Menière's disease he attributes altogether to disturbed cerebral circulation. In this connection he emphasizes the fact that involvement of the ocular muscles is noted in the vertigo of Menière's disease. This close relation between abnormal movements of the eye and aural vertigo has often been observed. Adler observed in one of his cases, referred to above, a quite perceptible movement of the eye during an attack of vertigo, and he believes that such abnormal movements are wont to occur in these attacks, but that they are too slight to be seen. He believes that, just as diplopia may prove the presence of a slight ocular paralysis not visible to the eye, so the various subjective ocular symptoms occurring in an attack of vertigo may be much more delicate tests of abnormal movements of the eye than visible manifestations. Hughlings Jackson even observed that mere pressure on the diseased ear in a patient subject to vertigo caused abnormal movements of the eye. Furthermore Hitzig found that the galvanic current, passing transversely through the head, produces vertigo and causes at the same time movements of the eyeballs, sometimes nystagmus.

In explanation of the occurrence of vertigo from ocular disease Mendel supposes that the sense of innervation of the ocular muscles is disturbed, and the false sensations are projected into the outer world so that the latter appear changed. Therefore the sudden instinctive movements, etc. I may add, in further explanation, the discord between such sensations and those derived from other sources, an explanation given above.

Mendel formulates his views in the statement that vertigo is a symptom-complex, consisting essentially in a disturbance of equilibrium brought on by disturbed functions of the ocular muscles. If the latter is not the seat of disease, the proximate cause of the vertigo is to be found in transi-

tory circulatory disturbance in the nuclei of the nerves of those muscles.

From the foregoing we cannot doubt the intimate relationship of the eyes to attacks of vertigo, but at the same time we cannot agree with Mendel in denying the influence of the semicircular canals. The facts already adduced seem to incontrovertibly prove the relation of the labyrinth to the vertigo. We find as further corroborative evidence, that attacks of vertigo are commonly attended by aural symptoms. In 94 of 106 consecutive cases of vertigo Gowers found deafness or tinnitus or both.[1] Furthermore when labyrinthine disease has progressed to such an extent that there is total deafness, the vertigo usually ceases altogether, indicating that the vertigo was caused by irritation of the nerve-fibers in the semicircular canals, and ceased when those fibers were destroyed.

Whilst therefore we must grant both the ear and the eye a prominent part in the production of the manifestations of vertigo, it strikes me that the ear must be given the first place, and that the eye is rather secondarily affected. Perhaps we should believe with Adler that objective vertigo—apparent movement of visible objects—is due to anomalous movements of the eye, and subjective vertigo—the feeling as if the individual were moving—is due to the labyrinth.

Other diseases or conditions that cause vertigo very likely do so indirectly through their effect upon these parts, especially on the labyrinth. This is probably true of so-called reflex vertigo, of that from toxic causes, of gastric vertigo, etc. Doubtless in many of these instances the diagnosis is incorrect, and the true cause is unrecognized labyrinthine disease. In others there may already be an abnor-

[1] It must, also, be remembered that the semicircular canals may be the seat of disease when there are no aural symptoms, for they are supplied by the vestibular nerve, whilst the nerve of hearing is distributed among the nerve-elements of the cochlea. It is true that the limits of the labyrinth are so narrow that a lesion usually produces symptoms from all parts at the same time; but this does not always occur.

mal irritability of the labyrinth that needs but trivial exciting cause to produce the attack.

In all instances the condition of the nerve-centers is of prime importance—that is the subcortical center of equilibration, or the higher cortical center, wherein we must locate conscious sensation. In some instances a primary instability of these centers is a special predisposing condition requiring but slight exciting causes to bring on vertiginous attacks; in others existing peripheral disease (usually in the labyrinth) secondarily establishes an instability of the brain-centers, which becomes the most important pathologic factor in the production of an attack of vertigo. This secondary instability of the brain-centers must always be kept in mind in considering the physiopathology of vertigo, as well as in the application of therapy.

A few words on some special clinical forms though this brief sketch must necessarily be very incomplete.

Aural vertigo.—Any disease of the ear may be attended by vertigo, but it is because it directly or indirectly affects the labyrinth. Reference will be made here only to well-defined labyrinthine vertigo. These cases are often spoken of as Menière's disease, though it has been insisted on on many sides that this term should be limited to that class of cases described by Menière, in which there is a very acute process in the labyrinth, such as an acute and intense inflammation or hemorrhage. In some instances of this kind the symptoms are so sudden in onset and so severe that they simulate an apoplectic attack. In a severe paroxysm, in addition to the intense vertigo—sometimes so violent as to hurl the patient to the ground—there is likely to be tinnitus, deafness, nausea and vomiting, pallor and cold perspiration. The latter may be in part due to the sense of terror which the attack usually inspires. Such attacks may be of frequent or infrequent occurrence, or occur at irregular periods, while in the free intervals milder vertiginous sensations, tinnitus and deafness continue. Sometimes there

is complete recovery especially as to the vertigo. Commonly there is gradual progress in the aural symptoms until complete deafness results. With the occurrence of the latter the vertigo usually ceases.

Other cases of labyrinthine vertigo of less severe type have like symptoms but in a milder form.

Ocular vertigo.—Various ocular defects, hypermetropia, astigmatism, etc., have been noted as causes of vertigo, but the disease of the eye most clearly acting as a direct cause of such attacks is sudden paralysis of the external muscles of the eye attended by diplopia. This vertigo is usually not severe and rarely persists for a long period of time. It may be avoided by covering the affected eye.

Gastric vertigo.—In general practice probably the majority of cases of vertigo are attributed to the stomach, a false diagnosis in most instances. According to Gowers less than 5% of the cases of definite vertigo are of pure gastric origin. But very likely in a much larger number some digestive disturbance is at least one factor in provoking attack. We may make the diagnosis of gastric vertigo with the greater certainty the more distinct is the gastric disorder, and the less the evidence of the presence of more common causes. Gastric vertigo may be either mild or severe.

Neurasthenic vertigo.—Vertiginous sensations, more rarely distinct attacks of vertigo, belong to the most common manifestations of neurasthenia. The heightened instability of the nervous centers, so common to neurasthenia, may be looked upon as the basis of most of these manifestations. We may in addition find the common exciting causes, gastric disorder, toxic contents of the intestines, impoverished blood, aural disturbances, etc. In many instances the vertigo is distinctly of psychic origin. For instance the cases of morbid fears—the "phobias"—where in a crowded theater, a public square, or what not, the patient is suddenly seized with a sense of fear, usually attended by vertiginous

sensations. This vertigo is mostly of the subjective type and is doubtless of cortical origin.

Vertigo of arteriosclerosis.—Vertigo is an important symptom of arteriosclerosis. It is supposed to occur especially in its earlier stages. According to Huchard, the causes which finally lead to arteriosclerosis, in the beginning lead to transient spasm of the smallest arteries, a condition more likely to produce vertigo than the later permanent changes in the vessels. Mendel states that influenza, or other weakening influence, is especially likely to bring on vertigo in these cases. Not rarely in these cases tinnitus is also observed, and in some of them the real cause may be in the labyrinth.

Vertigo from organic brain-disease.—Vertigo is a common symptom of organic brain-disease, most common with lesions of the medulla, pons, cerebellum and *crura cerebelli.* It is not necessarily severe, but most so in case of lesion of the crura, which is likely to be attended also by forced movements. This vertigo usually ceases in the supine position. Commonly other symptoms of brain-disease are found at the same time, especially a reeling gait.

Just a few words more on treatment. Removal of external causes, tobacco or other toxic agent, etc.; remedying as far as possible bodily conditions, which are exciting causes, such as ocular defects and stomach disorders; and attention to constitutional conditions, such as anemia and neurasthenia, are self-evident factors in treatment. In all instances the lessening of the irritability of the nerve-centers is important, for which the bromids are the most promising drugs. They may be assisted by belladonna, aconite, phenacetin, etc. At the same time we must attempt to obtain a permanent improvement in this direction by a general tonic treatment.

Labyrinthine disease may be due to gout, rheumatism or syphilis, which would demand their appropriate treatment. Quinin and the salicylates have been highly recom-

mended for the relief of labyrinthine vertigo, but probably will not often prove of value. Counter-irritation by means of blisters or cautery over the mastoid may afford some relief.

The vertigo of arteriosclerosis requires special attention to that condition. Small doses of the iodids, nitroglycerin, stimulants, etc., are in place.

HOW THE GENERAL PRACTICIAN CAN AID IN THE ADVANCEMENT OF PSYCHIATRY

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In order to make my paper as comprehensive as possible in the time allotted I have thought to divide it in two general divisions. First—As to the more recent achievements of psychiatry. Second—The factors already at work promoting its advancement and additional factors that must be enlisted to accomplish the best results.

It has become a common complaint in various scientific quarters that psychiatry as a science has not kept pace with the growth and progress of her allied medical sciences; that she has fallen into a rut and continues to pursue her narrow channel without any manifestation of expansion in her domain. Contented with the personal comforts which the state provides, with the light given by the therapeutics of today, satisfied with a recovery rate which has not increased perhaps in a quarter of a century, she pursues without the least perturbation her even course, seemingly without a flitting thought that the causes of mental disease might be probed by scientific investigations, or the result of treatment might be a more flattering reward for the money and pains expended.

Granting some soul of truth to be in this mild impeachment is there not a degree of severeness about it? If

we indulge ourselves for a moment in retrospection, can we not recall our Egyptian, Babylonian, and Assyrian history, when the entire subject of insanity was engulfed in the grossest superstition and given up entirely to the demoniac idea; the succeeding metaphysical era when it was regarded as heresy to hold that physiology and anatomy must go hand in hand; that the duality of man must maintain, that the spirit and flesh were two things apart; that to hold mental disease to be the result of physical defect was a sufficient revolt against orthodoxy to drive one from the walls of the sanctuaries?

One is reminded of that famous painting "The Anatomists" by Rembrandt, illustrating how in medieval times it was considered a sacrilege to pursue anatomic research. As the study of anatomy was retarded by the vagaries of those times, so has the study of psychiatry been thwarted for centuries by the absurd superstitions of ecclesiasticism. It has only been in later years that Science, allowed to pursue her way unobstructed, heralds the dawn of a new era in her history, and the present is denominated the positive or scientific period in psychiatry. Since the emancipation of psychiatry it has taken its place at the side of the other sciences and already has made surprising progress. For the evidence of this we would modestly remind our complainants of the work of Eustachio, Varolio and Vesalius, as remote as the 16th century. That of Willis, Vienssen, Sylvius, Vic'g d Azyr, Rolando, and others of the 17th century. That of Reil, Goll, Burdach and others of this century, all of whom have immortalized their names in the fields of the coarser anatomy of the brain. Especially would I mention the achievements of that veteran in psychiatry Mynert, who with his own fingers and forceps picked patiently at the bands of fibers of hardened specimens until he had given us what we know of the various connecting and intercommunicating fibers of the brain. Those of Ferrier in "Brain function" and Localization;

those of Wundt and Ladd as experimental physiologists; those of Hodge and Man in "Changes of Nerve-cells," and Flechsig in "Development of Nerve-Paths." In further testimony of the achievements of this science, we have to note the discovery by Ehrenberg, in 1833 that the "Seelen-organ," or organ of the mind, is made up of numberless small tubes. The first description of the ganglion-cell by Remak in 1838. In 1842 Stilling saw for the first time the ganglion-cell in the anterior horns in a plain frozen section made by his scalpel. This was rapidly followed by the process of hardening by alcohol, staining by the chrome salts, the cutting of thin sections by the microtome. By the aid of hematoxylin combined with the chrome salts Weigert was able to bring out the nerve fibers under the microscope, as well as to roughly outline ganglion-cells. Gerlach in 1858 improved upon the ganglion-cell by his introduction of carmine, and later in 1883 Golgi by his silver-salt method was enabled to show the relation of axis-cylinder to the ganglion-cells. The greatest impetus to the investigation of the finer brain anatomy however, was lent by Nissl in 1885 in the use of magenta red, dahlia, and vesuvin as staining agents. By careful examination of normal and pathologic brain-cells, Nissl claimed to demonstrate pathologic changes in the cortical nerve-cells, which were previously unable to be determined. In 1890 Nissl first published his methylen-blue method, previously employed by Ehrlich in blood technics, and by means of this and his improved method of 1894, all that we know of ganglion-cells has been worked out through it or modifications of it as employed by such investigators as Rhem, Lenhossek, Held and others. The Nissl method of investigation has enriched our knowledge of the finer brain anatomy over every other, as it has enabled us, from the various pictures it presents, to make divisions and classifications. The divisions are based upon the amount of "chromatic substance" in the cells, while the classification

of the various types is dependent upon the arrangement of this substance.

So far investigators in their efforts at comparing the pathologic cell with the normal types, have met with varying success. In the field of this investigation as applied to cortex disease in insanity, valuable results have already been obtained. Paresis has been located among the organic brain diseases by the microscope. Nagy found various changes in the chromatic substance, cellular degeneration to complete disintegration of the ganglion-cell. Berkly of Johns Hopkins has a report of like findings. These lesions now are always seen in sections taken from the frontal lobes, and hemorrhagic changes are in special evidence in cases with epileptiform seizures. Tirelli describes similar changes in epileptic insanity in the cortical cells. Cramer found changes in paranoia. Hammerberg, in an extensive monograph, shows that the essential lesion in idiocy consists in congenital deficiency in the number and development of the brain-cells. Berkly investigated the lesions of alcoholic poisoning in cortical nerve-cells, and a distinct shrinkage of all the cells was revealed, as well as a varicose atrophy of the dendrites. Bevan Lewis has shown that positive changes have taken place in these cells in cases of chronic melancholia and dementia. It has only been within the last two decades that such active work has been prosecuted along these lines. The workers in the realm of bacteriology and normal histology and pathology, finding them all but exhausted, have directed their efforts in the field of the nervous system, and have reaped large returns for their pains. However the microscope is but one of the pillars at present supporting the great basal work of investigation into the subject of psychiatry. It does not however open up to us any view of the multiple causes now at work creating the changes in the ganglion-cells of the brain which we see under the lens. To be able to see disintegrated, degenerated, atrophied, or any abnor-

mal cell, is but to view the damage which has been done. It is the wasted land after the drouth, the devastation left after the storm, or the mangled bodies left after the battle. While it has and will lead the way, the microscope must be supported in this work by other factors in the medical armamentarium. Bacteriology and biology must be enlisted to enable us to study the dynamics and laws of cell-life. Psychiatry must not longer be restricted in its investigation. The methods of the past half-century have played their part in the role of a specialty. As Van Giesen truly says, "What is needed is less 'specialized' and more 'generalized' study of the pathology of the nervous system."

The agencies already alluded to must be further reenforced by the study of embryology as pursued by Edinger, by experimental physiology as presented by Horseley and Monk, pushing localization to closer limits, and yielding more knowledge of the sensory functions and by physiologic chemistry teaching us more of cell-nutrition and a more perfect information of the antitoxins. Comparative neurology will always hold an important place, normal psychology must contribute her share along lines followed by Spencer, James, and the Mills. Psychopathology will contribute her share in clearing many of the functional neuroses and no psychiatrist or neurologist can afford to ignore it. Equally important is the study of blood examination of the insane, anthropology which the studies of Benedict and Lambroso have furthered, as well as morphology and pathologic physiology. At the present time all these factors are adding their increment through the labors of individual investigators. The bibliography of the subject numbers all of 1,000 volumes. 500 laboratories are pursuing various methods of inquiry into the anatomy of the nervous system alone. Two years since New York set the pace on this side of the water by establishing a State Hospital's Pathologic Laboratory, devoted to the investigation of psychiatry. Here all the medical sciences

are to be allied and employed in the interest of searching into the cause and cure of insanity. Success in unveiling the obscurities of psychiatry is not dependent upon the laboratory workshops alone.

One other important factor must always be recognized as playing an important part, and that is clinical observation. In this department the gleanings gathered by those having our aggregated insane under observation will prove of the greatest advantage. In the broad sense they are not investigators, but clinical observers. In the field of pathologic psychology they will always lend invaluable aid to the achievements of psychiatry.

To hasten my application it is in clinical psychiatry where the aid of the general practician will be of most value. It is he who first observes the patient, and is in a position to possess himself of all the facts in the case; and yet the meagerness of data as generally recorded in the medical certificates of insanity, places the physicians at the hospital at great disadvantage. There are various reasons for this which I am to be pardoned if I point out. First the inadequate instruction on this subject in our medical colleges. Convenient to most of the medical centers of learning now are hospitals for the insane. No student should go forth without having had the advantage of sufficient clinical lectures to enable him to record a diagnosis in most of the cases of insanity to which he certifies, especially when nine-tenths of them may be classed under the three general heads, mania, melancholia and dementia. With the adoption of the four-years' course every student ought to be well grounded in the anatomy and physiology of the nervous system before receiving his diploma, and be well informed in psychiatry and neurology as a part of his training in internal medicine. It is no longer a demon to be driven out, but a disease to be healed. It is not an entity beyond our ken. It is a disease not unlike other diseases, and comes within the pale of science.

In the light of what we know of heredity, of degeneracy and its stigmata, of exhaustion and its effects, of malnutrition, of the effects of alcohol and drugs, of syphilis, of tuberculosis, the frequent assigned causes of insanity, as "disappointment in love," "loss of property," "fright," "self-abuse," seem absurd, and furnish the record shelves of our State Hospital with some amusing curios. Then there is a temerity about placing on the certificate data relating to the antecedents of a case. Frequently there is nothing in the history as regards heredity, when later there are found to be a whole line of insane or defective relatives. A certain degree of carelessness in the first examination of cases obtains, and too great stress is placed upon the mental symptoms. Every case of insanity should be looked at in the light of it being one belonging to internal medicine. All the means of physical diagnosis should be employed; the urine should be tested; the sputa if there is any suspicion of tuberculosis; the blood-count should be made; the contents of the stomach examined, and digestive powers noted. The excreta should not be neglected, and in fact the products of all the excretory organs examined. It is to be remembered that the early symptoms of any disease are the purest, and all cases of insanity first fall into the general practician's hands, and upon him depends the noting of these early and more important clinical symptoms. Being possessed then of a knowledge of the history of the antecedents in a given case, of the habits, of his diseases, his occupation and manner of pursuing it, of his personal characteristics and all that obtained by a thorough physical examination, the aid the general practician is able to render the advancement of psychiatry as of the greatest importance. All such data should be incorporated in the medical certificate of each case of insanity and made to complete the records of the case as filed in our hospitals. But the mere use of our senses alone for the purposes of observing details, whether these be in the cell of a dead

tissue or the symptom of a diseased condition in clinical work are not sufficient. They of themselves would never develop a science. It is the employment of the faculty of reason, of logic, that which follows a train of facts in the transition from cause to effect, and delves into the philosophy of a science, which will develop and perfect it.

Psychiatry has been denominated the science of sciences. It occupies the loftiest pinnacle of science, and in order to obtain a full view of the marvels of her inmost recesses all the sciences of medicine must of necessity be used as stepping-stones, and only by the aid of these will her devotees be able to approach her.

THE SYMPTOMATIC TREATMENT OF CONSUMPTION

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From a clinical as well as from a pathologic standpoint consumption may be regarded as a dual process, *viz*: tuberculosis of the lungs upon which is engrafted a septic and inflammatory condition due to various microorganisms, principally streptococci.

The symptomatic treatment of consumption will depend largely upon the relative importance of the influences exerted by these two factors in any individual case.

We have, while the disease is in its early stage, the symptoms due to the tubercular processes. These are principally manifested as impaired nutrition accompanied by loss of weight, feeble digestion, lethargy, anemia and palpitation of the heart. The cough, fever and night-sweats, while present, do not cause serious inconvenience until later, when we also have the lesions due to the secondary involvement of the larynx and intestines.

Having no specific means by which we are enabled to destroy the tubercle bacilli we are compelled to depend

upon the inherent powers of the body for the accomplishment of this purpose or the modification of their deleterious influences. The support and improvement of the nutrition of the body is therefore the goal toward which we must at first direct all our efforts.

Nor should we ever lose sight of its importance, no matter how serious other symptoms and conditions may be. For the attainment of this purpose we must be watchful of the digestive and assimilative abilities of our patients, not forgetting the influence of foods and remedies upon these functions as well as upon the metabolic processes.

The symptoms just mentioned as present during the first stage of the disease are all doubtless due to the toxemia resulting from the absorption of the products of the activity of the tubercle bacilli, of portions of the disintegrating bodies of the dead germs, and of products of the activity incited in the cells of the body by the presence of the tubercle bacilli.

The efforts to neutralize and destroy these toxins by means of serum antitoxins has so far proven nugatory. Nor has the use of the products derived from the bodies of the tubercle bacilli yet reached the perfection necessary to gain the confidence of the profession. Our efforts, therefore must be directed toward counteracting the deleterious influences of the pathologic processes by improving the physical condition of our patients. We thus increase their powers of resistance and possibly enable them to inaugurate reparative or conservative changes in the parts involved.

In other words the treatment of pulmonary tuberculosis is dietetic and hygienic, and the deleterious symptoms of the disease must be combatted upon lines not calculated to compromise our efforts in this direction.

Toxemia. For the toxemia of the early stages but one remedy seems to retain the confidence of the profes-

sion—creasote. Creasote has no effect upon the development and growth of the tubercle bacillus, as even in a 30% creasote-bouillon it retains its virulence and productive powers. It diminishes however the poisonous quality of the tubercle culture apparently by its chemic effect upon the toxins. Its favorable influences are probably due:

First. To its bactericidal effects upon the bacilli associated with the tubercle bacilli.

Second. Its stimulating influence upon metabolism.

Third. Its power of neutralizing toxins.

It may be given in doses of from one to three drams daily and, if the patient enjoys the proper hygienic conditions, no disagreeable results follow its use. It has slight, if any, poisonous effects and its beneficial influences are shown in the increased appetite, gain in weight, remission of cough, diminution of night-sweats, and the amelioration of other symptoms of toxemia.

Malnutrition. Our first efforts when endeavoring to improve the physical conditions of our patients must be to secure for them sunshine and fresh air. I shall not dwell upon their necessity, but shall illustrate by the accompanying maps the deleterious influences exerted by living in damp, poorly lighted and ventilated houses. We can thus realize the importance of the environment as a predisposing factor and as contributing to render the course of the disease unfavorable.

On the first is indicated by dots the location of the residence of 250 patients admitted to the Cincinnati Branch Hospital for Consumptives, the other was made by our former health officer Dr John M. Withrow, and illustrates the relative proportion of deaths from consumption from the various portions of the city. Anyone acquainted with Cincinnati will recognize that the bottoms, hillsides and the older portions of the city are indicated as the locations of the greatest prevalence of the disease and the highest mortality.

The food should be highly nutritious and easy of digestion. Daremberg says, "The stomach is the citadel of consumptives, and food their chief means of defense." Upon the functional abilities of the stomach therefore our results will largely depend. A large majority of our patients suffer from dyspepsia, which is largely nervo-motor in character and is symptomatic of the general faulty condition of the body which it tends to increase.

A urinalysis should be made at times in order to judge of the assimilative functions of the body, a decrease of urea indicating a diminished destructive metamorphosis of the tissues of the body and a want of appropriation of the nitrogenous elements of the food.

In this connection it will be well to consider two foods or remedies frequently given in large quantities and I think with undesirable results. I refer to cod-liver oil and whiskey. If taken at all the dose of the former should not be more than two drams *per diem*. While it frequently disorders digestion the principal reason for objecting to its use is that in the pulmonary capillaries, being highly oxidizable, it is rapidly converted into carbon dioxid and water, with the liberation of a large amount of heat. This transmutation of the oil is so rapid that no evidence of fat can be found in the pulmonary veins.

If the quantity of oil taken is insufficient in amount to seriously compromise the ordinary metabolic processes of the body through the removal of the oxygen necessary for the accomplishment of this purpose its influence may be salutary. The necessity for oxygen to assist in the metabolism of the nitrogenous foods must never be forgotten. Its absence would result in a deficient elimination of urea with a compensatory amount of less highly elaborated but more poisonous xanthin bodies. No constructive or reparative elements are found in the oil, as heat and energy alone can be obtained.

Alcohol likewise should be used only in small quan-

tities if given at all, as its affinity for oxygen subjects it to the same objections entertained for cod-liver oil; besides by forming with the hemoglobin of the red corpuscles a compound which takes up and parts with oxygen less readily than normal hemoglobin it also interferes with metabolism. Its inhibitory effects on the formation and functions of the leucocytes and other corpuscular elements of the blood and tissues of the body are likewise detrimental. The chronicity of the disease renders it unnecessary to employ alcohol as a stimulant, its food-value alone being wanted.

The elimination of alcohol by the lungs, increasing the congestion of the bronchial mucous membrane and thus enhancing the cough, is also objectionable. The digestion and appetite are compromised, the heart's action is impaired through fatty degeneration, and other functional and pathologic conditions are produced or intensified. Strychnin can well be substituted for it as a stimulant while a full nitrogenous diet will be all the nutriment required.

Cough. The cough of consumption is symptomatic, not so much of the tubercular processes in the lungs, as of inflammatory lesions and irritation of the mucous membrane of the bronchial tubes and upper respiratory passages.

For its relief local treatment should be adopted, the application of menthol and zinc-chlorid solutions made to accessible parts, while those which are lower down can be influenced by intratracheal injections. This method of treatment is one that still lacks the support of the general profession and Ewart speaks disparagingly of it. My own experience has caused me to give it enthusiastic support. It is grateful to the patient, and has never to my knowledge been followed by other than beneficial results. This method of treatment also enables us to dispense with opium and its derivatives in the cases we can hope to benefit permanently. The preparation employed at the

Branch Hospital is composed of menthol, camphor and eucalyptol each 3%, guiacol and iodoform each 1%, in liquid petrolatum.

We must resort to opium to relieve the cough of patients who have reached an advanced stage of the disease; but to do so is to acknowledge our inability to confer more than euthanasia. Potassium bromid will frequently enable us to dispense with the use of opium, particularly when the cough is nervous in origin.

Night-sweats. The lungs have excretory functions and assist in the removal of waste products of the body as well as carbon dioxid. Their importance in this respect is demonstrated by the fact that the lungs exhale fifteen ounces of water daily, one-half of the amount excreted by the skin.

In consumption this function of the lungs is greatly compromised and, as the kidneys are also frequently partially incapacitated, the task of compensating for their inability is thrown upon the skin when the autointoxication has become sufficient to cause a temporary paralysis of the vasomotors and a relaxation of the skin capillaries. This occurs more frequently when the patient is asleep. The sweating, being a result of systemic poisoning by carbon dioxid and the products of destructive metabolism, is a conservative process. Its treatment is consequently of doubtful propriety and seldom necessary under proper hygienic conditions. A number of drugs are lauded as valuable in this condition. At the Branch Hospital one-tenth grain doses of agaricin usually suffice. If ineffectual atropin is given.

Fever. Any considerable elevation of temperature in consumptives is the result mainly of the action of septic agencies. The fever at first depends upon the extent of lung involved. It is then due to absorbed toxins and reactive inflammatory changes. Later the absorption of broken-down tissues and caseous matter increases its

height. This is augmented still more by the inflammatory fever caused by the products of other pathogenic bacteria. For the relief of this condition ordinary remedies are useless if not harmful, and the antistreptococcus serum is positively injurious. Quinin at times seems to have a useful and lasting effect. Rest and the open-air treatment must be chiefly relied upon. Cold baths have only a temporary and sometimes a harmful influence.

Hemoptysis. The hemorrhage which occurs during the first stage is due to diapedesis and the rupture of capillaries in the inflammatory areas about tubercular lesions. It is usually salutary and requires no treatment further than to endeavor to combat the local condition by means of increased nutrition through an improved circulation in the parts. Ergot, nitroglycerin and quinin have proven beneficial for this purpose.

The hemorrhage which occurs later in the course of the disease is due to the rupture of large vessels weakened by ulceration, dilatation and removal of contiguous tissue. The establishment of a thrombus in the artery is the object of our therapeutic endeavors. As experiments have shown drugs to possess little or no influence over the pulmonary arteries and the circulation in the lungs, this object can only be promoted by slowing the heart's action by means of aconite and morphin.

The patient should be placed in a reclining position and fresh air freely admitted to the room. If the bleeding is persistent, movements of the chest may be limited by adhesive strips and the return-flow of blood from the lower extremities withheld by constricting the thighs. Ice-bags by causing a contraction of the more healthy vessels of the lungs are apt to be harmful through increasing the force of the circulation and the quantity of blood sent to the diseased parts.

DISCUSSION

Dr John A. Thompson, Cincinnati: After several years' experience with the use of intratracheal injections in the treatment of pulmonary affections I wish to add my testimony to the efficacy of this method in controlling the cough in tuberculosis. The most distressing cases to the physician, and also to the patient, are those who have violent paroxysms of coughing immediately after meals, and who in these paroxysms vomit up the nutriment which they so badly need.

I began using the intratracheal injections first in a case of tuberculosis of this kind—a woman who was vomiting all her meals, who was not able to sleep at night and who was rapidly journeying to the future world from loss of nutrition. I found in that case that an injection of a 2% solution of menthol directly into the trachea, given at four o'clock in the afternoon would control the coughing so that she would retain her supper, (which was the best meal for her) and would sleep six to eight hours during the night before the cough again disturbed her. That woman is still alive though she has chronic tuberculosis. That woman was going steadily down hill before the injections were given and I believe that she would have made a complete recovery if it had not been for a pregnancy.

Another affection in which these injections are of great benefit is in syphilis of the lung. I had a case under treatment in which the lower right lobe was very much involved. The expectoration was so offensive that no trained nurse could stay with her more than a few minutes at a time. It was full of pus, and when the nurse went in to attend to her necessary duties she would come out again as soon as possible. She had been saturated with mercurials and the iodids for four years. She had fallen from a weight of 170 to 127 pounds. I stopped the cough and expectorations in a little over six weeks with injections of menthol and guaiacol. At the present time she weighs 170 pounds, and she does not know that she had anything the matter with her lung. Of course you cannot expect results like this in tuberculosis.

Again the menthol and guaiacol control the fever as nothing else will do.

You would not attempt to disinfect a leg ulcer by giving medicines through the stomach and it is just as silly to

attempt to treat a suppurating cavity in the lung by giving remedies in this way, especially when you have so safe and easy a method of applying the remedy directly to the diseased area.

When this injection method was first brought to the attention of physicians by Dr Green his statements were so extraordinary that the New York Academy of Medicine appointed a committee to see whether or not they should expel him from their body for lying. The committee made their investigations and reported that Dr Green could do everything that he had said he could, and that his results were exactly as he had published them, but this treatment dropped out of sight and was revived again in England. The first article I ever saw in regard to it was by Dr Downie. About two years ago I wrote an article on this subject which was published in the *Journal of the American Medical Association*, which was again taken up by the London *Lancet*, and the editor of this journal made my article the basis for an elaborate editorial.

You can give medicines in this way without disturbing the nutrition and it is much more efficient than administration by the mouth. You can relieve the cough of tuberculosis, and control the vomiting without the use of opiates.

Tracheal injections are not hard to give if you have a patient with a little bit of intelligence. You can put three to four drams into the trachea. Anybody knowing how to use the laryngoscope to make an examination of the larynx can give these injections, and the disturbance caused will be very slight. Dr Lyle told me that he had never had any bad results from this method of treatment, but any beneficial measure which is powerful for good at times will do harm. I never use it in an acute inflammation where there is no secretion.

These tracheal injections are much better than nauseating expectorants, their effect is much more rapid and there is less systemic disturbance than there could be in medicine given through the stomach.

Dr L. B. Tuckerman, Cleveland: In considering the newer treatment, and the brilliant results obtained in occasional and exceptional diseases we are inclined to overlook the fact that the most important papers read before an association of this kind are those which relate to the diseases

which we all meet every day. I have been exceedingly interested in the paper of the gentleman from Cincinnati because the hopelessness of the consumptives that we meet in our hospitals is sickening to the heart. I have come to feel that when a workingman, or woman, who must earn a living by hard day's labor, with a pick and shovel for instance, once becomes thoroughly infected with tuberculosis, he will die, not so much from the disease itself but from the helplessness of his condition, for there is no middle stage for him between a full day's labor and idleness. When he is convalescent he can do nothing until the time comes when he can take up his shovel and keep up his end with the rest of the gang. This is not true of men following intellectual pursuits. With men whose circumstances are fairly comfortable it is quite different, they can work a little and rest a little. The hardships of the laboring man and the constant grind that he endures do not fall to the lot of men in more easy circumstances.

I was much interested in the statement made by the gentleman, (a statement which was also made in my hearing by Dr Thompson last year) that these intratracheal injections will quiet the cough. We have tried everything in the way of cough-mixtures at St. Alexis Hospital, all with equally unsatisfactory results and I am going to try this remedy so soon as we are taken out of quarantine. I am going to ask you, Doctor, for that formula.

I now wish to say a word about the hypodermic use of strychnin in these cases. In private and in hospital practice I have been using it for some time. I use 1-20 of a grain either once or twice a day hypodermically, and it is wonderful to me how it overcomes that feeling of exhaustion, and how it improves the nutrition.

I had this spring three cases of tuberculosis with fever (there was no question about the tuberculosis for I had found the bacillus in the sputum) and with laryngeal symptoms. They came to my office every day for their hypodermic of strychnin and were able to keep at their work (it was light work and in two cases, out-of-door work). Two I sent west and I have received reports from them that they feel well and do not know that they are sick. The third patient is acting as a special sanitary policeman in front of a smallpox-infected house. His temperature runs from 100½° to 102°, but his appetite is good and there seems to be no progress of the disease.

I regard strychnin infinitely better than alcohol as a stimulant because I know of no drug which is equal to it as a stimulant to the nutrition. It so greatly improves the appetite and general condition. There is another thing about strychnin, as someone has said, it is one of the few honest drugs we have. You can always tell when you are getting too much of it by the exaggerated reflexes.

Dr Lyle, Cincinnati, closing: The hopelessness of treatment among the laboring class of men and women is indeed distressing as Dr Tuckerman has said, although this is the class of patients in which we can get the best results from treatment in consumption. Of course for a workingman to return to his vocation is as a rule impossible, for the reason that you never see these patients until they are in the second, and possibly the third stage of consumption. A workingman will never apply to a physician for treatment in time to do him any good. At home we frequently have a man go to the hospital with a large cavity in his lung and a history of being sick for only two or three months. They do not seek treatment until they are compelled to quit work. Because of their physical condition they should be the very best class of cases.

Another reason why they go down rapidly is that we have in a great majority of these cases to contend with the effects of chronic alcoholism. It is not to be expected that we can obtain good results in people who are chronic alcoholics, and that is one reason why we should, I think, stop the use of this drug.

In regard to intratracheal injections I would say that I had under my care a little girl on whom we used this method of treatment and in a very short time her weight increased from 51 to 69 pounds. The little girl has been going to school ever since her treatment and has not missed a day this year.

Intratracheal injections are something in which I have a great deal of confidence. A physician of one of our large consumptive retreats visited our hospital and remarked that he heard but little coughing. I showed him how we treated them and after his return home he sent to me for a syringe in order that he might adopt the same method. The practicability of this treatment was very evident to him.

In reference to strychnin I would say that I consider

this a most valuable drug and I usually combine it with arsenic and quinin, 1-40 of a grain of strychnin being given four or five times a day.

Dr Mary J. Finley, Mansfield: I would like to ask Dr Lyle to describe a little more minutely the technic of the intratracheal operation.

Dr Lyle: The technic of these injections is very simple. All you want is a syringe and a laryngoscopic mirror. The patient protrudes his tongue and holds it with a towel, the larynx is exposed by pressing against the soft palate with the mirror and you then put the tube of the syringe down. Some advise putting the tube in between the vocal cords, but if you do this you very frequently get a spasm of the glottis and the patient will expel a considerable amount of the injection. I put the tube in just above the vocal cords and ask the patient to take a deep inspiration and in this way not a drop is lost. I seldom give less than five drams, and have frequently given ten drams without any deleterious effect.

DIGITALIS AND THE HEART

G. M. WATERS, M. D., COLUMBUS

The medical profession is apparently doomed to submergence in the literature of so-called new pharmaceutic preparations. Scarcely a day passes when the mail fails to bring a printed mass of trash, setting forth in the most alluring manner the multitudinous virtues of some particular therapeutic agent. This annoyance, I regret to say, is not confined to methods referred to alone, but permeates medical periodicals to a degree almost intolerable. Even the great *Journal of the American Medical Association*, for the support of which we practically pay $5.00 each year, carries advertising almost balancing reading matter page for page. It appears that at the present speed of departure from it we are soon to lose sight of the reliable old United States Pharmacopea. It is from this old standard I select for brief consideration a common drug which is much used and frequently abused.

Digitalis is indigenous in Europe but is cultivated in this country for both ornamental and commercial purposes. While the entire plant contains medicinal principles, the smaller leaves only of the second year's plant should be used: the latter being plucked during inflorescence. Not infrequently we prescribe digitalis with disappointing results, which may be due to adulteration, deterioration, imperfection in manufacture, or possibly to unintelligent prescription. If the preparation is adulterated with mullein or inula, or deteriorated through cultivation or preparation, satisfactory results need not be expected. Such preparations, judging from results, are frequently found in the shops.

According to Schmiedeberg's analysis, digitalis contains five active principles, *viz:* digitalin, digitalein, digitoxin, digitonin, and digitin. Of so-called active principles, digitalin, digitalein and digitoxin are heart stimulants and have a similar action to digitalis; digitonin is a sedative and digitin is inert. After Navitelle's discovery of what was called digitalin in 1871, the profession prescribed this product extensively until results plainly showed the remedy to be decidedly inferior to digitalis. Anent this part of the subject I desire to quote from a private letter from Dr Edward R. Squibb of Brooklyn. Dr Squibb says: "There are probably few substances in the materia medica of more importance than digitalis and I beg to remind you that it earned and won this importance as digitalis and not as any one of the so-called active principles. It is within my time that it was shown that the fine large leaves of the first year's growth should be rejected in favor of the smaller leaves of the second year, and that these should be gathered during or just after inflorescence. Then it was shown that wild, indigenous plants were better than cultivated plants and that a certain degree of care was necessary in drying and transportation, and finally that especially in the presence of moisture the activity diminished after two years,

and, unless very well cared for, the stock should be renewed annually. Then it was shown that a well-made fluid extract was the best representatitve of the drug and was practically unchangeable,—that the tincture was next best, but the solid extract not trustworthy, probably from being made with heat. This is the digitalis that for the past fifty years has accumulated its character and importance by its utility and has established the digitalis effect. Now it seems trite to say that if you need this digitalis effect and will go to such digitalis for it, you will get it.

But about twenty years ago the chemistry that pulls things to pieces started upon digitalis, and it was first shown that it contained no alkaloids, but that it could be split up into several so-called active principles: and then mercantile competition in the interest of pecuniary profits under the name of scientific investigation, made a market by advertising as many as four direct and nine or ten derivative preparations. Digitalin was, and perhaps is still the prominent one of these, but the product of different makers differs so much in appearance, properties and dosage as to preclude the possibility of their being the same thing or even nearly the same. Then there is digitonin, digitalein and digitoxin, all with special description and claims, but none with satisfactory proof of being fairly representative of the entire drug, nor with any fair claim of securing its good effects while avoiding its objectionable effects—cumulative and explosive for example. And in my experience it is rare to meet a physician who knows how to use digitalis, who is troubled with cumulative effects, yet the risk of cumulative effects is urged against the use of digitalis and in favor of the digitalins."

Concerning the most important of the active principles, Wood says: "The digitalin of commerce is a complex body of various composition, power, and even properties, and there is no sufficient reason for its employment."

That digitalis has objectionable properties, cumulative,

explosive, and nauseating, for example, no one presumes to deny. The so-called active principles have the fault of being deficient in satisfactory representation of the original drug, besides questionable stability and uniformity of strength. Preferring to confine myself in what I have to say to digitalis I omit a consideration of the active principles.

During the past half-century no drug, with the possible exception of belladonna, has received more attention at the hands of experimental therapeutists. Gerrard published a monograph on fox-glove in 1597, and a few years later Parkinson recommended the remedy for scrofulous sores, and internally for "falling sickness." In the 1721 edition of the London Pharmacopea, and probably earlier editions, digitalis was honored with space. For reasons best known at that time it was dropped therefrom in 1746. Withering in the seventies of the 16th century, investigated the therapeutic powers of the drug and more than likely his research had some influence in replacing digitalis in the British Pharmacopea as an officinal drug. Among more recent investigators may be found the names of Schmiedeberg, Brunton, Traube, Ringer, the Woods, G. B. and H. C., and many others. The result has been the establishment of a broader field of usefulness for digitalis, and of the fact that there is no excuse for its misuse.

To establish an intelligent basis for the prescription of digitalis it will be necessary to examine briefly into its physiologic action. That this action is complex has been clearly demonstrated, thus accounting for its numerous indications. In a general way digitalis is a stimulant and tonic to the heart and vascular system; a diuretic, a hemostatic, and in large doses a paralyzant. The experimental therapeutist's road to understanding has been, and is today, seriously obstructed by unsolved physiologic problems bearing upon the innervation of the heart. In this the physiologist has been invaluable, clearing the way for both

to arrive at conclusions which should be the basis for the intelligent use of the drug. It is not meant by this that the innervation of the heart is even now clearly understood; indeed additional knowledge has overthrown theory after theory, which appeared to answer for the time, and it is doubtful if present conclusions, although the result of years of patient research, will stand long under the light of continued investigation.

The chief sphere of usefulness of digitalis is in diseases of the heart. Before examining the physiologic action of the drug, we should first know that the heart is provided with a double innervation; an extra- and intracardiac mechanism. An isolated heart under proper conditions continues for a time to pulsate, due no doubt to the action of the resident ganglia. Continual action however is normally maintained through external influences and communications, chiefly the vagi and sympathetic nerves. Resident cardiac ganglia appear to relieve the necessity of a special complex central apparatus, such as is required in maintaining the respiratory function. Stricker located in the medulla a center which if electrically stimulated, after section of the vagi, causes a decided quickening of the heart's action. These accelerator impulses are born to the heart by way of the sympathetic nerves. If the heart had no other office than to pump a given amount of blood into a system of inert tubes, probably no regulating provision would be required. With motor influences in abundance, and under certain conditions superfluous, an inhibitory or governing mechanism is provided for in the vagi. If these important branches are divided, the heart, under accelerator influences, becomes rapid and unsteady. Galvanism applied to the peripheral end of the divided nerve causes slowing or arrest of all action, according to the amount of stimulation. Horseley illustrates the phenomenal influence of the vasomotor system with this experiment: The splanchnics of a rodent are divided, and the vessels of the

abdominal viscera become so extremely dilated as to produce death by depriving the important centers of blood. It is this great sympathetic system then which presides over the vascular caliber, regulating the flow of blood to every part as occasion demands. While all of these remarkable mechanisms are subjects for profound admiration, their real importance is never fully appreciated until disease disarranges them.

The principal distinctive actions of digitalis are: first, a marked slowing of the heart's action by prolonging diastole; second, increased muscular force, and third, augmented vascular contraction. Stimulation of the inhibitory apparatus, narrowing of the vascular lumen with consequent increased resistance, and augmented force are all factors in diminishing frequency of the heart's action; the chief influence acting through the vagi. When digitalis is topically applied to the heart marked muscular contraction is induced. Whether the effect is a direct stimulation to the muscular fibers or through the peripheral nerve is a question not satisfactorily settled. If the drug is administered internally in sufficient amount the ventricles may be made to contract with such force as to produce marked pallor as the result of complete emptying of the cardiac cavities and vessels. That digitalis increases heart force when administered in therapeutic doses is beyond question, if we are to accept either clinical evidence or physiologic deductions. Brunton, B. Foster and others found that digitalis increases arterial pressure. Fothergill placed the web of a frog's foot under the microscope and on the application of digitalis noted marked contraction of the arterioles. Wood quotes Atkinson's statement that if the abdomen of a rabbit be opened so as to expose the arteries of the mesentery a very marked contraction, even to the partial obliteration of the lumen of the vessels, may be readily seen to follow the administration of digitalis. While Ringer suggests that this action is directly on the

arterial muscular tissue, Traube and Boehm's experiments indicate that it acts mainly on the vasomotor center. Here we have evidence of digitalis retarding motion by its action on the inhibitory nerves; increasing force by direct action on the cardiac muscle or ganglia, or both; and a constriction of all vessels from its effect upon the vasomotor center or vascular walls, decidedly increasing arterial pressure.

We now have a physiologic basis for the intelligent prescription of digitalis, and a logical deduction that the remedy is indicated in all conditions attended by a feeble, frequent and irregular cardiac action. The following paragraph is *apropos* and quoted from H. C. Wood: "When the muscle of the heart is for any reason unequal to the task set it, the systoles become rapid and imperfect, and by this irregular action of the ventricles, neither completely filling nor completely emptying themselves, increase the embarrassment. Under these circumstances digitalis, by lengthening the diastolic pauses and increasing the force of systolic contractions, causes the ventricles to fill themselves completely in the one and to empty themselves completely in the other act. By subduing irregular action through the inhibitory nerves and by energizing the muscular power of the heart-walls, the remedy is of incalculable service, and increasing arterial pressure all over the body causes the disappearance or lessening of symptoms due to low pressure in the arteries. It is a logical necessity, if our reasoning as to the physiologic action of digitalis has led to a correct result, that the drug should be of the greatest service when the lesion is simply a loss of cardiac power; and clinical experience tallies with this *a priori* argument. In simple dilatation, or in simple failure of the cardiac muscle without valvular lesion, the results of the use of digitalis are the most favorable."

It is unfortunate that many physicians limit the use of so valuable a remedy to organic diseases of the heart, when its sphere of usefulness is clearly much broader.

No one will deny the truth of this statement, and I may incidentally remark that it was this fact alone which suggested the title of the paper here presented.

Valvular diseases of the heart advance stage by stage to either hypertrophy or dilatation, or both. So long as compensatory hypertrophy balances the deficiency no serious symptoms develop and no special medication is indicated. Niemeyer clearly recognized this fact from clinical experience, which he preferred to physiologic deductions, and said: "Digitalis in pure uncomplicated hypertrophy is unsuitable." However when this natural provision of nature fails, as it will earlier or later, the equilibrium between the work required and the work done will be disturbed and a familiar train of symptoms follow. Providing the lesion is a mitral insufficiency, the right ventricle in turn dilates and the blood regurgitates to the right auricle and great veins. The breath is short from pulmonary stagnation and there will be palpitation and enfeebled and irregular action of the heart. The liver is engorged, the gastrointestinal mucosa congested, and there is disordered renal function and dropsy. While this distressful condition portends almost immediate dissolution, broken compensation may often be restored and the sufferer relieved sufficiently to return to the ordinary duties of life perhaps for years. The chief remedy is digitalis. The lagging heart-muscle is stimulated to renewed activity, the frequency of action becomes slowed and regular, the heart more completely fills and empties, arterial circulation is revived, venous stagnation is relieved, and in consequence of all this the suffering is either wholly relieved or made bearable. The same remedy is appropriate for all valvular diseases with the possible single exception of aortic regurgitation. Objection to its use in this instance is that prolonged diastole favors the return of blood into the ventricle. Theoretically the objection is valid; practically the tonic effect of digitalis wholly offsets its unfavorable action,

and the rule should be sustained to administer digitalis in all cases of feeble, frequent and irregular heart.

Ringer says that digitalis will often quell the tumultuous strongly-beating heart, strengthen the pulse, at the same time reduce its frequency, and improve the patient in every respect. My experience has been that in such cases cardiac sedatives act more satisfactorily.

In cardiac dropsy the renal epithelium is supplied with stagnant blood and becomes sluggish. Digitalis tones up the dilated heart, the circulation becomes active, and diuresis results.

DaCosta's "irritable heart" responds promptly to the exhibition of digitalis and I might go on enumerating its indications; however this is not essential so long as we bear in mind the general principles set forth in foregoing paragraphs.

Concerning the dangers of digitalis, when intelligently prescribed, they practically cease to exist. I desire to substantiate this statement by the evidence of H. C. Wood, who says: "That in the experience of twenty-five years in which I have used digitalis, frequently in enormous doses, I have never seen a case in which I thought it did serious harm by toxic action."

Administration. The powdered leaves, infusion, tincture, fluid and solid extracts are all potent providing they are pure and properly made. While some physicians believe the best results are obtained from the infusion, it is probably owing to the administration of comparatively larger doses. I pin my faith to the fluid extract and tincture, begin with small doses, require that both shall be the products of Edward R. Squibb & Sons, and rarely fail to obtain satisfactory results.

Chapter IV—Surgery

APPENDICITIS

HUGH F. LORIMER, M. D., FAIR HAVEN

The subject announced today still claims the attention of the profession very markedly, judging from the number of papers on this particular disease at this meeting. While the committee on program in arranging the symposium may have had in mind that the best should come last, I shall be content to flatter myself that a high private in the rear ranks was given first place. If the arranging of the symposium had been left to me, I should have made only one change, and that the paper by Dr Vance. "When should the Surgeon be called in a case of Appendicitis" should follow mine.

I probably will steal some of Dr Vance's thunder. The last topic is a fitting one to close with, for all positively cured cases of appendicitis end surgically. Someone has said, "a good Indian is a dead Indian"—a safe appendix is one cut off. The physician and surgeon have fought on this disease ever since its discovery, from those highest in authority in medicine to the remotest practician. It is common to see such statements as these: "The pendulum is swinging the other way now, as it did in oophorrectomy, and surgeons are not operating in appendicitis so often as in former years." It is probable surgeons are not operating in *peritonitis* so often as they once did because of such an accumulation of experience in unfavorable results; they think it high time that the physician is learning that unwarranted delay means death, and the surgeon is quite willing to let the responsibility rest where it should. Because a few years ago a lot of *fool* doctors became disciples of Beatty, is there anyone to lift his voice against the honest

opinion of Wyeth, Morris, Richardson, Murphy, Senn, Ashton *et al*, because they demand interference when surgical skill is indicated?

It is not right to compare sacrificial surgery to the removal of pathologic conditions menacing life. The subject will continue to be brought before the profession often until every member of it believes that appendicitis exists and that it is a common disease. When the practician ceases to eye the surgeon as a blood-loving, chance-taking creature with hoofs and horns, but is willing to assist him to decide when the "last resort" opportunity is offered, then $\frac{1}{8}$ of the program at a state meeting will not be given to one subject. The general practician should be heard from oftener, for it is likely 99% of cases first fall into his hands.

Dr Norman Bridge said that "appendicitis is one of the most frequent and dangerous of inflammatory diseases in or about the peritoneal cavity." This disease is so common that, when excluding zymotic fevers, it is the cause of 80% of all inflammatory abdominal troubles in the male. This is not meant to show comparison in sexes, but again to emphasize the commonness of the disease. There seems to be a difference of opinion as to frequency in males compared to females. Appendicitis has had a remarkable history as a study, and to America is due the advance made in the development of the study. It was twenty years from the time that Willard Parker began opening perityphlitic abscesses, when, in 1886, Fitz gave us the pathology of typhlitis, perityphlitis and cecitis; and Sands took up the work where Parker left off. McBurney lamented the fact six years ago that Sand's name appeared so seldom with the subject. Those who condemn surgeons for wanting to find new diseases for operation would do well to know something of the honesty of this great man. You will remember that up to about 1890 much was said about typhlitis, perityphlitis and cecitis; Murphy says now that 98% of inflammatory troubles about the *caput coli* are appendicitis.

It is noticeable that almost up to the abandoning of these terms the knowledge of troubles at this location was gained at the postmortem table; since that time the operating table furnishes specimens of the disease in all its stages, hence we get recent pathology.

The first thing to learn is that appendicitis is a surgical disease; second peritonitis is not a disease; third, no such thing exists as idiopathic peritonitis. I believe the time is here when physicians are looking for the cause of peritonitis. It was not uncommon a few years ago to see in the mortality reports of cities peritonitis given very frequently in the list. For four months of the fall and winter of '97-'98 I purposely noted the mortality list in a Cincinnati daily, and there was not one report of peritonitis.

PATHOLOGY

"From a bacteriologic aspect the appendix may be regarded as an open test-tube and the retained secretions a culture medium." (Senn). When an area of infection of any sort in the mucosa or peritoneal covering of the appendix takes place, bacteria at once enter the lymphoid structure and the cellular coats. The stage of exudation begins and the tissues as a result are compressed. If this business went on in the colon there would be plenty of room for swelling and exudation, and there would not be compression. The appendix keeps on swelling, but the point of exit for inflammatory products becomes smaller. Then add to these conditions anemia, because there is only a solitary terminal artery, and we are able to appreciate the aptness of Senn's illustration—a test-tube, culture medium—now the infection into the tube (usually mixed) and lastly the tube closed.

ETIOLOGY

"The etiology, which was for a long time a subject of contention, is now practically agreed upon. It was very difficult to eradicate from the professional mind the deep-

rooted erroneous belief that in a great majority of cases appendicitis was due to foreign bodies admitted into and retained in the appendix, as grape-stones, cherry-stones, fragments of bone, etc. We had four cases of foreign body and 38% of fecal stone. To indicate the causes of appendicitis, I will use the same classification employed in my article of March 3, 1893:

"1. Simple pus infection, producing the catarrhal variety.

"2. Extensive infection by *bacillus coli communis* or pyogenic microbes, producing gangrene of a greater or less portion of the appendix.

"3. Pressure atrophy with infection of the appendix: (*a*) by fecal concrement; and (*b*) by foreign bodies.

"4. Retention accumulations: (*a*) from cicatricial contractions, stenosis and obliteration; and (*b*) from occlusion by enterolith or foreign body.

"From the reports of autopsies collected I find that in 70% of the cases there is a perforation of the appendix. Of my own cases in which the appendix was removed there were about 80% perforated.

"Simple catarrhal primary appendicitis, if it exists, is rarely brought to the attention of the physician, and still less frequently to the attention of the surgeon. Of 207 cases reported, we had but one of this variety. A catarrhal inflammation where the more serious form of appendicitis had previously existed is not uncommon." (Murphy.)

SYMPTOMS

"The symptoms of appendicitis are: (1) a sudden pain in the abdomen; (2) shortly followed by nausea, and perhaps vomiting; (3) local tenderness over the site of the appendix and most frequently in the right iliac region; (4) elevation of temperature. These symptoms occurring in this order, without a previous history of genitourinary infection,

lesions of the gall-tracts or Pott's disease, indicate appendicitis with almost uniform regularity. They do not indicate that the appendix is gangrenous or that it is a simple catarrhal appendicitis. They do not indicate whether the appendix has perforated or has not perforated; nor whether the cause is an infection with the staphylococcus, streptococcus, *bacillus coli communis* or the presence of a fecal stone or a foreign body. They do not indicate whether it is stenosis of the appendix or an *appendicitis obliterans*, but merely that it is an appendicitis, a disease of the appendix." (Murphy).

To be called at this hour to see a patient taken suddenly sick, especially with severe pains over the stomach, there would be a routine course as to the subjective examination present itself to me. I was impressed some years ago by reading a work by Sir Henry Thompson on urinary diseases with this statement: That there were four questions always to be asked in suspected urinary diseases, and always in regular order, too. And out of these grew all other questions. The same can be said of pain in appendicitis.

1. *Location.* Where is the pain? "Over the stomach," "in the bowels," "through the bowels," "in the bladder," are common answers. A great majority complain of the stomach, and this one thing fools more physicians than any other symptom, and so often leads the attendant to at once attempt to confirm the patient's belief that the trouble is in the stomach by the objective sign, palpating the stomach, and next whack out the hypodermic and treat the patient for neuralgia of the stomach—neuralgia of the stomach is an uncommon disease—subjective and objective examination, diagnosis and treatment all in a jiffy.

2. *Character.* Pain is sudden, severe, cutting, sharp, and, as I have heard it described, cruel. The suddenness of the pain is often taken to mean acute indigestion.

3. *Cause.* Inquiry in the majority of cases will tell

you they erred in diet or did something out of the ordinary, which they attribute as the cause, and many will say: "I allowed my bowels to become constipated, which always brings on these attacks," an expression in which there is more truth than poetry.

4. *Number of attacks.* If you have not found out by the previous questions as to whether this is a first attack, such wants to be determined before making an examination. This is not always as easy as we might at first suppose. Not with intended evasion on the part of the patient, but for lack of appreciation as to its importance, which cannot be over-estimated by the physician. You will be told that the patient had attacks of neuralgia of the stomach, or was threatened with inflammation of the bowels, or is subject to bilious spells, or has been treated through an attack of inflammation of the bladder, etc., etc. So much for pain. Vomiting does not last long as a rule; if it does, and there is stercoraceous matter, the case is dangerous. Pulse does not count for much in the very early stages. Temperature is no guide; it is likely the vast majority of cases never reach 101°; fatal cases, proving so in twenty-four to thirty-six hours, may never reach 100°.

Tenderness is elicited by pressure over the base of the appendix; the location is not quite always the same. The tenderness can be found over what is called McBurney's point, which is one and a half to two inches inner to the superior spinous process of the ilium, on a line drawn from the process to the umbilicus. (It would be better, as individuals differ so in size, to say where the right side of the recti muscles cross the line designated.) This point is not found by shutting the fist and bearing down upon the abdomen anywhere below the umbilicus, but, to use McBurney's own words: "When with one finger you make firm pressure over this point in a case of appendicitis, you will usually find that pain produced is greater at this point than at any other." I would always search for this unawares to the

patient. Rigidity of the abdominal muscles, especially of the right side, is a very important sign. Recurring or relapsing appendicitis are applied to cases which occur after first attacks. Recurrent cases are those which come on at intervals of a year or so; relapsing, those attacks which are very close, say every week or two. Symptoms of recurrent attacks are same as those of a primary one. One attack predisposes to another. Hawkins claims 23% and Fitz 44% in which there has been a previous attack.

The statement made that appendicitis is purely a surgical disease is not to mean that every case is to be operated upon, but that a surgeon should always be in communication or present in a case that is in any way severe. And note what I say from the medical side of the house.

"We do not know the line between proper medical treatment and the demand for surgical interference, and rather despair of finding it. The medical man is practically powerless to control the destiny of the patient. It is always a surgical disease, and the mortality should be materially lessened by skillful surgical treatment." (Norman Bridge.)

"So impressed am I with the fact that we physicians lose lives by temporizing with many cases of appendicitis, that I prefer in hospital work to have the suspected cases admitted directly to the surgical side. The general practician does well to remember whether his leanings be toward the conservative or the radical methods of treatment; that the surgeon is often called too late, never too early. There is no medicinal treatment of appendicitis. There are remedies which will allay the pain, but there are none capable of controlling the course of the disease." (Osler.)

"As soon as the diagnosis is established—indeed, pending its settlement—a competent surgeon should be associated with the physician for the reason that in the vast majority of cases operative treatment is sooner or later demanded, while the hour for such treatment is best settled by daily conference. The course of cases of appendicitis is

often delusive, and the surgeon who operates is frequently more likely to have seen more cases than the physician. The diagnosis being established, operative treatment should be recommended, except in cases where the disease is so far advanced as to make it unlikely that the patient will be saved by operation. My reason for this belief is that while a majority of cases of simple appendicitis may subside with rest, in a very large number, at least 25%, the primary attack leaves the patient predisposed to another, at once more severe and dangerous than the first, while we have no guarantee that any attack will subside without suppuration, or, what is worse, without leaving the condition referred to, in which malignant inflammation or perforation may set in at any moment without warning." (Tyson.)

The consensus of opinion on the surgical side is that when a diagnosis is made in the acute form, if there is not much improvement in the pain, pulse no better, temperature continues above normal and tenderness is marked, operate in 36 or 48 hours. Osler puts it at the outside 72 hours. The medical treatment must be meted out according to each case, and in each case right early we conclude that "a condition and not a theory confronts us."

Rest in bed first.

A great majority of cases get over the attack with free purgation and enemas, while in some anything that brings about peristalsis of the bowels hastens the rupture of an abscess into the peritoneal cavity, followed with peritonitis, and yet if peritonitis should announce itself salines are to be administered with a flush hand.

The physician and surgeon have crossed swords in the use of opium in these cases, the physician often administering opium not only until the patient is easier, but rendering him quite comfortable; narcotizing his own judgment in the case, benumbing the fears of the friends, both physician and friends to be aroused in a few days to realize that the case has proved fatal. The surgeon, on the other hand, is not

content with letting the spirit of Alonzo Clark rest, but attempts to drive one more nail in his coffin by giving no opium. It seems to me there are some cases in which the pain is in the extreme that the hypodermic injection of morphin is not only indicated as a means of relief, but for its diagnostic value. Though with a sparing hand opium should be given, I should despair of repeating the dose without advisement of surgeon. Hot fomentations are to be used; if tumefaction is present I believe the ice-bag better until surgical aid comes to our hand. I have seen 26 cases of appendicitis in my practice and in consultation the last seven years, mention of which will be made in discussion of other papers.

CONCLUSIONS BY ASHTON

1. That as we have no exact means of determining the pathologic changes going on we must consider all cases of appendicitis dangerous from the beginning.

2. That to wait for evidence of perforation of appendix, pus, bowel obstruction or peritonitis is unwarranted delay.

3. That marked local tenderness over McBurney's point, continued elevation of temperature, rapid pulse and tumefaction are conditions indicating immediate operation.

4. That in mild cases, with a positive diagnosis, operation is demanded in 48 hours if no improvement has taken place.

5. That all cases should be operated upon as soon as the diagnosis is clear.

HOW TO DEAL WITH THE APPENDIX IN PUS-CASES

W. D. HAMILTON, M. D., COLUMBUS

According to a recent surgical authority (Wharton and Curtis) appendicitis may be divided into four classes:—(1) Appendiceal colic; (2) Catarrhal appendicitis; (3)

Appendicitis with abscess; (4) Appendicitis with perforation, *i. e.*, sudden perforation of a diseased appendix when no preformed adhesions protect the general peritoneum from infection.

With reference to the treatment of cases comprised under the head of class (3), I believe that no one will seriously maintain that a collection of pus about the appendix should not be evacuated as soon as the diagnosis is established: always providing that the operation be done by one who has had a reasonable experience as a surgeon. No one can deny on the other hand that many such abscess-cases might get spontaneous relief by evacuation of the pus through the colon, rectum, bladder, or abdominal wall. The same is true of abscesses arising from other causes; they tend to point. It is good surgery, however, to incise them without waiting for spontaneous discharge. Practically the same rule should be applied to pus about the appendix, with the qualification above suggested as to some degree of experience on the part of the man who assumes to use the knife.

When a surgical operation for appendicitis is undertaken there are two objects in view: (a) To save the life of the sufferer from the present danger which threatens it; and (b) To remove the appendix if possible and prevent recurrence of the same condition in the future.

The first indication is met by incision—in more than one place if necessary—evacuation and disinfection of the abscess-cavity with the careful avoidance of infection of parts not already involved in the inflammatory process. This implies intelligent treatment of the pus-cavity and its limiting wall. The abscess has ordinarily such a wall, and the adhesions which compose it are of varying density. Therefore one should be prepared to encounter a pathologic structure which may be handled with impunity, or one so delicate that the most trifling manipulation destroys its integrity, permitting the escape of pus and

infectious material into the healthy peritoneum with the result of general septic peritonitis. In the face of contingencies of this kind the second indication—the removal of the appendix—becomes an important and sometimes puzzling question. From the following quotations it can be seen that some of our surgeons are decidedly conservative in their attitude.

"There are some cases, not few in number, in which the appendix is so deeply embedded in the wall of the abscess or so difficult to define at all, that to insist upon its discovery and complete removal would be to incur quite unjustifiable risk. One had better be content with properly evacuating, cleansing and packing the cavity—leaving the appendix or its remnant to be disposed of by its obliteration in the wound healing or by its removal at a later and more favorable time through a second operation." McBurney (*University Medical Magazine*, March, 1896.)

"It has been my practice to carefully evacuate and cleanse by dry sponging with sterilized or iodoform gauze the pus-cavity, then to disinfect its walls with a bichlorid solution of 1 to 5000, then to search for and remove the appendix in case it can be readily found and easily separated from the adhesions in general. I have found this feasible in cases operated on up to the seventh or tenth day. In cases operated on at a later date or those where the abscess is distinctly circumscribed with firm walls and the contained pus amounting to several ounces I have not attempted to remove the appendix." Bull (*University Medical Magazine*, March, 1896.)

"It has been my habit for years in cases of acute appendicitis with extensive suppuration to simply incise, disinfect, and drain the abscess, unless the diseased appendix could be removed without any additional risk. I have seen a number of such cases recover permanently without any additional surgical interference. I regard persistant search for the appendix in such cases hazardous, as it often results

in opening of the free peritoneal cavity and fatal septic peritonitis." Senn *(University Medical Magazine,* March, 1896.)

There being such competent evidence as to the danger of removing the appendix in some cases of abscess, what factors shall guide us in adopting one course or the other?

When pus forms as a result of inflammation of the appendix, it is to be found in one of three localities—superficial to, behind, or to one side of the cecum, and within a comparatively short distance of that organ.

(A) It may be slightly external to and behind the cecum, traveling upward along the outer side of the colon.

(B) It may lie behind and internal to the cecum, immediately below the termination of the ileum in the cecum. At this point it readily advances over the brim of the pelvis into the space between the bladder and the rectum, but is prevented from extending upward by the mesentery of the last few inches of the ileum.

(C) It may lie internal to the ascending colon above the termination of the ileum.

For an elaborate and valuable account of this subject one should refer to the article by M. L. Harris, *Journal of American Medical Association,* December 21, 1895.

(2) In case of general suppurative peritonitis the pus may be found in any part of the abdomen, multiple incisions being necessary for its thorough drainage. (3) Pus may also be located extraperitonally behind the cecum or colon, while the appendix may or may not have a peritoneal covering. The above-named divisions include practically all of the localities in which pus is to be found in cases of appendicitis. The incision should be so located as to enter the pus-cavity without traversing healthy peritoneum if that be possible. If it be impossible, healthy intestines should be carefully excluded from the field of operation by proper packing with gauze sponges, each sponge having attached

to it a clamp of tape in order that it may not slip away and be forgotten. The omentum or intestine which overlies the abscess should then be released from its adhesion until the pus escapes. Thereupon the finger is carried at once gently into the pus-cavity and its limits defined while it is still comparatively full; otherwise it may collapse after emptying and certain recesses escape observation. The examining finger should also search at once for the appendix, lying free in the cavity, or embedded more or less firmly in its walls of adhesions. The appendix may be recognized generally as the hardest, most irregular and nodular structure which the finger encounters, and the diagnosis may be confirmed by tracing the deformed organ to its origin from the posterior surface of the cecum. The detection of a fecal stone in the substance of that which seems to be the appendix may also aid in identifying it.

Having found the appendix, the next step is to remove it, if that be advisable. If it lie quite free and exposed, its removal is easy. If it be in the wall of the cavity, and especially if it be on the side nearest to uninfected peritoneum, which usually means toward the median line of course, I believe that one should proceed with the utmost caution. The incision should be enlarged to the full extent of the abscess-cavity in order that the operator may have the benefit of sight as well as of touch. Then cautious efforts may be made to peel the appendix out of its inflammatory bed. If considerable effort is required to do this, or if we cannot find the appendix, or if we learn that the appendix makes an essential part of the wall of adherent viscera, it is better to desist and be content with saving the patient from immediate danger by thorough drainage. It is not to be understood that breaking down of the adhesive wall with exposure of uninfected intestine is invariably followed by a fatal result. It has doubtless fallen to the lot of all operators to encounter those cases in which an incision directly over the induration in abscess cases, exposes a mass covered

with omentum, not adherent to the abdominal wall, with healthy coils of intestines crowding into the field. Here the proper use of gauze-packing serves to exclude the general peritoneal cavity from the region of the operation so that the infection is prevented from becoming general. However there is always far greater danger to life in the operative treatment of this class of cases than in those where the opening of the parietal peritoneum lets one directly into the abscess-cavity. It is doubtless true that the appendix can be removed with greater safety in abscesses when it lies to the outer side of the cecum, than when it lies toward the inner side. For the cecum and colon themselves then constitute a protective wall of no mean value during the necessary manipulations.

In cases of general suppurative peritonitis the appendix should always be removed unless the patient's condition is so critical that there is no more than sufficient time to make the necessary incisions and irrigation. When the abscess is retroperitoneal the appendix should be removed if it lie in the cavity. Here the danger of rupture and general infection is probably not as great as in intraperitoneal collections. Again in very small appendiceal abscesses, the pus and debris may be wiped away cleanly, the cavity disinfected thoroughly, and the operator may deliberately destroy adhesions in searching for the appendix, provided gauze-packing be used at each step in such a manner as to protect the general peritoneum. It would seem safer however to reserve this treatment for exceptional cases when operated upon at an early stage in the disease. The method of amputating the appendix when it is once freed from its surroundings varies with the case in hand. Occasionally it is gangrenous and comes away with the mere touch of the finger or it may be so softened as to be readily torn in breaking down the adhesion which holds it. There may be no hemorrhage as a result of thrombosis of its vessels; or the bleeding may be so profuse as to necessitate gauze packing. In

some cases the appendix will be but little damaged. In this event it should be removed by—first, ligation of its mesentery and second, a circular incision should be made through the peritoneum and muscular coat down to the mucosa. The resultant cuff is turned back so that the mucosa may be ligated close to the wall of the cecum, the cuff being then inverted by one or more tiers of Lembert sutures.

It is well to apply pure carbolic acid or the cautery to the mucosa after its division. I believe that as the experience of the surgeon increases the number of abscess-cases in which he can successfully remove the appendix will be much larger. Unfortunately however with our present knowledge we have no means of determining just how virulent the infection is in any given case, and just how much danger would be incurred in exposing the uninvolved peritoneal cavity. Therefore we shall continue to encounter cases in which it is wiser to be content with mere incision and drainage. In a few instances I have reopened the partly healed incision from ten to fourteen days after primary operation for drainage and have then removed the appendix. Although none of the cases resulted fatally my experience has been such as to condemn the method.

WHY DOES THE SURGEON FAIL TO FIND THE APPENDIX ?

N. STONE SCOTT, A. M., M. D., CLEVELAND

Professor of Principles of Surgery, Cleveland College of Physicians and Surgeons; Consulting Surgeon to the Cleveland City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-Patient Department of the Cleveland General Hospital, etc.

From time to time some prominent surgeon fails to find the appendix even in chronic cases, and is able to withdraw only with a feeling of discomfiture. Not long since one of New York's most eminent operators was called in counsel in a neighboring city, confirmed the family doctor's

diagnosis of chronic appendicitis, and advised an operation. No sign of an appendix was found, and the report was circulated that the man had never had an appendix. Truly a most uncomfortable position from a professional standpoint. A narrow escape from a similar accident in my own practice vastly increased my interest in the subject, forcing to the front some such questions as these:

Is the explanation of congenital absence of the appendix correct? If so, how frequently is it absent? If this explanation of congenital absence is not correct, why these failures to find the appendix? In any case why should a man who is a good diagnostician and skilled operator diagnose appendicitis and dissect out no appendix?

In order to get more light upon these questions, two circular letters were sent out, one to the leading surgeons of the United States, and one to the leading anatomists. The surgeons' letter asked for the number of cases operated upon, for the number of acute and chronic cases, and for the number of chronic cases in which the appendix had been absent. The anatomists' letter asked for the number of cadavers which had passed under observation, for the number that had apparently had no appendix, and also where no appendix was found whether a careful dissection and microscopic examination had been made.

A widespread interest was manifested, and some very astonishing facts brought to light in the replies received. Should this paper be of service to any in its attempt at scientific investigation, thanks are due, not to the compiler, but rather to the many members of the profession who have so kindly furnished the data herein presented. Of the surgeons who answered about 50% give the number of operations performed, one surgeon of international repute placing the figures for his appendicitis operations at 649. Since the list of those who answered, but without giving the number of operations, includes the names of Bull, Dandridge, Deaver, McBurney, Norris, Ochsner, Senn, Wyeth,

and others of note, it would seem to me conservative to estimate the total number of operations heard from at 10,000. Of the anatomists who answered four-fifths gave the number of cadavers observed, making a total of 8,049; adding an equal proportion for those who do not report the number, gives a like total of 10,000 subjects examined.

In the 10,000 operations for appendicitis there were many cases in which the appendix was not found. Most of them occurred of course in acute cases where a thorough search for the appendix was not deemed advisable. Excluding these there are left 29 cases which occurred in chronic appendicitis, in the hands of our best surgeons. Dr J. B. Murphy reports two cases; Dr W. W. Keen, one; Dr Hunter McGuire reports one case of apparent absence of appendix and one case where simply a small tubercle was found at the site of the appendix; Dr R. Harvey Reed reports one, Dr N. P. Dandridge, Dr W. T. Bull, and others. Dr Bull's letter is of such interest as to warrant its quotation in full:

"I recall only two cases in which I failed to find the appendix. In the first case it was found at a second operation, ligated and inverted, and had escaped observation by being buried in a dense but thin mass of false membrane, only a quarter of an inch of its cecal end was left. In the other case which occurred but a few weeks ago, there was but little false membrane or old adhesions; I investigated the cecum in all of its walls, and could find only an indefinite thickening of its coats over a small area on the site of its normal implantation."

Turning now to the 10,000 observations upon cadavers we find many anatomists who have never failed to find the appendix. Dr Matas writes in regard to 700 observations as follows:

"The examinations referred to were made in the course of demonstrations to students while Demonstrator of Anatomy in the Medical Department of Tulane University of

Louisiana from 1880 to 1895. I always made it a point to examine the cecum and appendix with care and took notes of anomalies. I never encountered a cecum without appendix."

After a careful search of the literature, and the writing of many personal letters, I have been able to find but five cases, observed in cadavers, in which a careful examination revealed no appendix, excepting of course those cases in which this absence was due to some surgical operation. These five cases were reported by the following: Dr W. E. Lewis, Cincinnati, Dr D. K. Shute, Washington, Dr J. D. Morgan, Washington, Dr J. P. Tunis, Philadelphia, Dr J. W. Swan, Philadelphia. Thinking that possibly the cases observed in the same cities might be identical, I have written personal letters to Drs Shute and Morgan of Washington, and Tunis and Swan, of Philadelphia. I would invite your attention to a careful study of these five cases.

The first is reported by Dr Lewis, who says in reply to the circular letter, "I have always looked for the appendix, and never found it absent but once. In that case no trace even of a rudiment or vestige could be found." In response to a personal communication he writes as follows: "In the subject in which no appendix was found, the cecum was free from any adhesions, and careful examination by myself and Dr Johnstone our gynecologist, failed to find even a trace of a rudiment of any part of its external surface. The interior was not examined for any dimple of the mucous membrane which might indicate the implantation of an appendix."

Next in order is that of Dr Shute, who reports having seen one case in which there was apparently no appendix; he gives no details of the case farther than to say that a careful dissection was made, but no microscopic examination.

The third case Dr Morgan says he found by chance in the dissecting room. "Finding no appendix of course

made a great impression upon me, but exactly what steps I took at the time I do not remember. The colon was not examined on the *inside*. I always explained the case in my own mind by thinking there had been an obstruction of the artery supplying the appendix, although there were no extensive adhesions. I do not remember of Dr Shute being present. I knew Dr Shute at the time. I am sorry I cannot aid you further, and doubly sorry my information is so meager."

Dr Tunis writes concerning the fourth case: "In the dissecting room of the University of Pennsylvania during the last five years I have examined at least 150 bodies, and do not remember more than one where the appendix was absent. In this case there was a careful dissection made, but no microscopic examination."

In regard to the fifth case Dr Swan writes a personal communication. "There were no evidences of old inflammation at the head of the colon, and the wall of the cecum was carefully examined to find any evidence of an appendix." In a report of this case, published in the *University Medical Magazine* of December, 1895, we find the following: "In examining the external aspect of the cecum, as it lay in the body, no trace of a *vermiform appendix* could be found; the serous covering of the bowel presenting no cicatricial tissue, thus indicating that this portion of the intestinal canal had not suffered at the hands of the surgeon. On examining the cecum from its internal surface the ileocecal valve was seen to be normal in situation and appearance. The normal situation of the *vermiform appendix* is on the posterior wall of this portion of the intestine, just internal to the position of the ileocecal valve, and on the mucous membrane of the bowel is seen a dimple marking the opening into the lumen of the appendix. No such dimple could be detected in this specimen. Situated below the orifice of the ileum is an oval ulcer. * * * The base of this ulcer is smooth and shining, the margins are

elevated, and for some distance from the raised border there is presented an appearance resembling that of several miliary tubercles. * * * Owing to advanced postmortem changes, microscopic sections, which were made, fail to show the characteristic appearance of a tuberculous ulcer, and the diagnosis of tuberculous ulcer has to be made from the macroscopic appearance alone. * * * Taking these facts into consideration, I call this a case of congenital absence of the *vermiform appendix*." A deduction which it does not seem to me the doctor is at all justified in making, in view of his statement in regard to the presence of an ulcer, and also of extensive postmortem changes.

It will thus be seen that in 10,000 cadavers there was an apparent absence of the appendix in but five cases in which a careful examination was made. In no one of the five was there microscopic examination. In the first case the internal surface of the colon was not examined; data in regard to the second are very meager, no record of it can be found in literature; cases third and fourth are reported at a late date from memory, not being considered at the time of sufficient moment to call for the taking of accurate notes; while the fifth case had already undergone advanced postmortem changes. This leaves no one of the cases in which we can be reasonably certain that there was a congenital absence of the appendix.

Note too the great discrepancy between the record of the surgeon and of the anatomist, the former reports six cases of "no appendix" to one of the latter. What then is the explanation of the surgeon's failure to find the appendix? We can not set it down to a lack of skill or care at the time of operation, since this failure has occurred at the hands of the best men in the profession.

In 1897 a case passed through my hands which almost resulted in my own Waterloo, and was converted from failure to succes only by a very narrow margin; it seems to offer at least a partial solution to the problem before us, so

I give it to you somewhat in detail. Mr. W—., aged 36, of small build, began some two years before to be troubled at frequent intervals with abdominal pains, associated with vomiting; though not confined to his bed for more than a few days at a time if at all, he gradually lost flesh and strength until he was finally compelled to give up his business; physical examination revealed nothing abnormal in any part of the chest or abdomen, except in the right iliac fossa; on account of the extreme emaciation it was very easy to palpate the abdominal contents, and in the right iliac fossa could be felt a small firm nodule, not movable and slightly sensitive.

A diagnosis of chronic appendicitis was made and an operation advised. Upon opening the abdomen no intestinal adhesions were found, and no appendix could be noted, notwithstanding the fact that a most diligent and careful search was made. Behind the head of the colon this small mass which had been noted on physical examination could be felt, and it was decided to dissect up the head of the colon in order to get at this mass, as it was thought probable at this time that we would find a retrocolonic extraperitoneal appendix. In dissecting up the head of the colon there was one point on the peritoneum, opposite the site of the *caput coli*, which seemed thicker than the rest and resisted the efforts at division. Carefully working behind this and coming down towards the brim of the pelvis we found that this thicker portion of the peritoneum passed over into the pelvic cavity, where it terminated at about one-half inch from the brim, coming to the other end it was found to have its attachment at the normal site of the appendix; behind the head of the colon was this small mass which we had previously felt and which proved to be an enlarged and inflamed lymphatic gland. Running through the center of this mass of tissue, by the side of the remnant of the appendix, could be noted the remains of the appendiceal artery. Two fortunate circumstances led to its detection; first, the presence

APPENDICITIS OBLITERANS TOTALIS

(MAGNIFIED THREE TIMES)

of the enlarged lymphatic gland; second, the fact that the appendix had originally dipped down into the pelvis. Otherwise we would have lifted the remnant of the appendix with the head of the colon, and then I doubt whether we could have discovered it however careful the search. (See photograph.)

The specimen was submitted to Dr A. P. Ohlmacher, Pathologist of the Cleveland College of Physicians and Surgeons, who reported that the appendix had been entirely reduced to connective tissue, and that the enlargement of the lymphatic gland was due to inflammatory changes. Thus the case was one of a rare condition which had resulted in the covering up of the appendix by a thin layer of false membrane, without adhesions to other organs, and the gradual contraction of the same into a small fibrous band; this may be denominated *appendicitis obliterans totalis.*

The cases of apparent absence of the appendix give a history of mild attacks running over a considerable length of time, and not of acute appendicitis, or of recurrent appendicitis.

Several reporters speak of an indefinite thickening of the head of the colon with no adhesions to other organs. My case confirmed these points and yet we were able to identify the remnant of the appendix by its fortunate anatomic position.

Appendicitis obliterans totalis offers a scientific explanation for the conditions found, and shows the great discrepancy between the observations of the surgeon and the anatomist; obviously the former is limited in his opportunities for making the most careful search by his care for the life of the patient.

Literature records no case which is not more rationally explained on the hypothesis of *appendicitis obliterans totalis,* than by the supposition of congenital absence of the appendix.

I have received replies to my circular queries, and in

many cases personal letters from the following physicians, whom I wish to thank most heartily for their invaluable assistance:

Allen, Dudley P., Cleveland; Balloch, Edward A., Washington; Blake, John D., Baltimore; Boldt, H. J., New York; Bryant, Joseph D., New York; Bull, W. T., New York; Bunce, W. C., Oberlin, O.; Bunts, F. E., Cleveland; Carr, W. P., Washington; Conner, P. S., Cincinnati; Craig, Joseph D., Albany; Crile, G. W., Cleveland; Dandridge, N. P., Cincinnati; Davis, T. A., Chicago; Dawbarn, R. H. M., New York; Deaver, J. B., Philadelphia; Eckley, W. T., Chicago; Ferris, H., New Haven; Fitz, R. H., Boston; Frost, G. D., Hanover, N. H.; Gallaudet, B. B., New York; Gill, Theodore, Washington; Hamann, C. A., Cleveland; Hartigan, J. W., Morgantown, W. Va.; Haynes, Irving S., New York; Hewson, A., Philadelphia; Jenner, N. R., Washington; Johnson, Robert, Baltimore; Keen, W. W., Philadelphia; Lamb, D. S., Washington; Langdon, F. W., Cincinnati; Lewis, W. E., Cincinnati; Lloyd, Samuel, New York; Lucas, F. A., Washington; McBurney, Charles, New York; McCosh, A. J., New York; McGuire, Hunter, Richmond, Va.; Madill, G. C., Ogdensburg, N. Y.; Matas, R., New Orleans; Mathews, Wm., Richmond, Va.; Means, W. J., Columbus; Moody, Robert O., New Haven; Morgan, J. D., Washington; Murphy, J. B., Chicago; Mynter, Herman, Buffalo; Norris, Dr, New York; Oliver, J. C., Cincinnati; Ochsner, A. J., Chicago; Oviatt, Chas. W., Oshkosh, Wis.; Park, Roswell, Buffalo; Parker, Chas. A., Chicago; Phelps, A. M., New York; Pole, A. C., Baltimore; Reed, R. Harvey, Columbus; Reyburn, Robert, Washington; Roddeck, T. J., Montreal, Canada; Senn, N., Chicago; Shute, D. K., Washington; Smith, Eugene A., Buffalo; Swan, John W., Philadelphia; Taylor, Hugh M., Richmond, Va.; Tunis, Joseph P., Philadelphia; Walker, E. W., Cincinnati; Wilder, Burt P., Ithaca, N. Y.; Woodward, Wm. C., Washington; Wyeth, John A., New York.

WHEN SHOULD THE PHYSICIAN CALL IN THE SURGEON IN APPENDICITIS?

ALLEN H. VANCE, M. D., SPRINGFIELD

While the most of us recognize that appendicitis is a surgical disease in a sense that it is not a medical one, yet a very large majority of the cases of appendicitis must filter through the hands of the physician before they reach the surgeon. This fact makes the answer to the question asked in the title of this paper: "when should the physician call in the surgeon in appendicitis," a most important matter.

It was only in 1886 that Dr Bull advocated the use of the aspirator to determine the presence of pus in cases of then so-called perityphlitic abscess. It was only in 1889 that McBurney advocated the early operation in appendicitis. The leaning of the general medical profession is toward conservatism, and the brute force of statistics must be brought to bear upon them for some time before they will yield to an innovation. Even today, in the community in which I live, may be found physicians who advocate nonsurgical interference in appendicitis, in all stages of the disease. If this is true in the profession, how much more certain is it that the public, who get their notions and impressions of what ought to be done in disease from the medical profession, are still, in some measure at least, violently opposed to what seems to them these dreadful operations that so often result in the death of the patient. But both in profession and public this feeling is rapidly changing, as case after case apparently desperately sick, is saved by operation.

I write from the standpoint of a physician anywhere from three to ten hours away from a surgeon, where the calling in of a surgeon, even in consultation, involves an expense of from twenty-five to fifty dollars at least. And by

surgeon I mean, not a man whose chief ingredient is brazen effrontery, but a man who has availed himself of every possible opportunity to perfect himself in his art before he attempts independent work.

Very frequently the circulation, position, conformation and contents of the vermiform appendix are such as to make it especially liable to sudden and violent attacks of inflammation which may readily go on to gangrene.

We recognize three varieties of appendicitis: catarrhal, ulcerative and fulminant, or gangrenous.

Usually if allowed to proceed without surgical interference, the catarrhal variety either eventuates in recovery or goes on into one of the other varieties.

In the ulcerative variety adhesions and the formation of inflammatory tissue occur, and a pus-cavity is formed which if small, on the arrest of the inflammation, may be absorbed, or may open externally, either directly or through some other channel, or into the peritoneal cavity, when it assumes the characteristics of the fulminant variety.

In the fulminant variety the appendix suddenly becomes gangrenous, quickly breaks down, empties its contained pus and frequently an enterolith into the peritoneal cavity, and produces death either from general peritonitis or from peritoneal septicemia.

The transition from one variety to another may be very rapid, so that the immediate need of a surgeon may become suddenly very urgent.

In every case of appendicitis, as soon as the diagnosis is plain, the physician should put himself in communication with a surgeon. In these days of the telephone, this is possible in nearly every part of our State at comparatively small expense. You may in this way prevent a fatal delay. If we were only able to determine the presence or absence of an enterolith, to determine the precise moment when pus begins to form, or if we could even anticipate the rupture of a pus-sac by an hour or two, this would be ideal.

But our aim must be to approach the ideal as nearly as possible. In almost every case in which I have called in the surgeon, after the operation I have asked the surgeon "Should I have called you in sooner?" and the courteous reply has been, "You called me very opportunely." Yet in every case he found the appendix had burst, pus and an enterolith in the peritoneal cavity, and the patient well on the road to general peritonitis.

In the catarrhal variety it is only when it becomes recurrent or chronic or when it shows a tendency to take on the characteristics of one of the other varieties that the surgeon is needed. It is the almost universal experience that when there has been a second attack, there will be others. Thus we can determine that the time for the coming in of the surgeon is between the attacks—preferably after the second attack. The operation between the attacks is much the safer one.

In the ulcerative variety is our greatest difficulty and danger of not doing the right thing at the right time. It is not always easy to determine the presence of pus; but when once we have decided that pus is present, delay, except in speedy abatement of all the symptoms, is exceedingly dangerous. There is no one symptom pointing to which we can say: "When this is present, call the surgeon, but it is rather a wise discernment of the totality of the symptoms that must determine this matter. If there is local tenderness, slight tenseness of the abdominal muscles, moderate pain referred to the right iliac region with rise of temperature and increase of pulse-rate, and this condition should continue for from twenty-four to thirty-six hours, I should call in the surgeon. If in the meantime the pulse and temperature should rise, or if the pulse rise without the temperature, or if there be sudden onset of pain, temperature and pulse remaining constant, I should then call the surgeon. The case may so suddenly become urgent that we must be prepared to act promptly and energetically.

In the fulminant variety the signs are unmistakable. The pinched face, the clammy skin, the acute sensitiveness and tenseness of the muscles over the whole abdomen, with the point of greatest sensitiveness in the right iliac region, make a picture, that, once seen, is never forgotten. Do not delay one moment unnecessarily, but at once call the surgeon and have everything ready for immediate operation. My experience would go to show me that we may call in the surgeon with some hope of saving our patient at a very late stage of the disease. In one of my cases the patient seemed to be at a very low ebb, and yet recovered after operation.

Again I am inclined to believe that, in what may seem to be a case of general peritonitis in young boys, without symptoms pointing in any special way toward appendicitis, we are justified in calling in the surgeon on the ground that nearly every case of general peritonitis in boys or youths is occasioned by appendicitis, even though there may be no clear history pointing toward it. I have found the consent of the parents or friends or the patients themselves, a most important factor. In one of my cases this consent, without which to call in a surgeon would be folly, nearly cost the fond mother the life of her child.

I have found that in cases once operated upon without removal of the appendix, we sometimes again need to call in the surgeon.

The following seven cases occurring in my own practice, exemplify most of the points made in the foregoing, and have proved a most interesting study to me. They were all verified as cases of appendicitis, either by operation or necropsy.

Case 1: My first case was seen December 11, 1888. It was the second attack of a recurrent case, the first attack having occurred six months before. Two days later the pus-sac burst, and in another two days the patient died.

Necropsy revealed general peritonitis with a gangrenous appendix and an enterolith in the peritoneal cavity.

Case 2: My second case, one of the first cases of appendicitis operated upon in this city, was seen July 7, 1894, in the evening. The condition indicated the formation of pus. In 48 hours there was no abatement of symptoms. I then summoned Dr Allen, of Cleveland, who operated on the morning of the 10th. A large pus-cavity was evacuated. The adhesions forming the wall of the cavity were of such a nature that the appendix was not removed. The patient went on to a slow recovery.

This same case showed signs of a recurrence of appendicitis on October 10, 1898, four years subsequent to the first attack with operation. On October 13, there being an exacerbation of symptoms, Dr Reed, of Cincinnati, was consulted. When he arrived, there being some abatement of symptoms, it was decided not to operate. Improvement continued until the evening of the 14th, when a small tumor made its appearance in the right iliac region, the fever began to rise, and on the 15th Dr Reed was again summoned. He operated on the morning of the 16th. He found a large pus-cavity pretty well walled off from the peritoneal cavity and containing about a pint of putrid pus and an enterolith. The recovery was uneventful.

Case 3: The evening of September 1, 1897, I was called to see Dr K. He had been suffering from what he thought was a simple case of enteritis. His pulse was ninety and his temperature 100°. There was no localized tenderness. That night (at 2 A. M.) he had a violent attack of pain, referred to the umbilical region, following straining at stool and vomiting. He was given a hypodermic of morphin by another physician who saw him at that time. In the morning I again saw him, when his pulse was 100 and his temperature 99½° with pain localized in region of appendix. I called Dr Reed, of Cincinnati, who operated

at 7 P. M. We found the appendix gangrenous at the tip, ruptured, and two enteroliths in the abdominal cavity. There were large quantities of thin, light-colored pus in the peritoneal cavity without any well-defined retaining wall. The signs of peritonitis were abundant. He died of peritoneal septicemia on the 6th.

Case 4: July 24, 1898, I was called in, in the morning, to see what, to the parents, seemed like a case of colic. The symptoms pointed toward appendicitis. The following morning, the symptoms having become more grave, I called Dr Reed. He operated, finding a ruptured pus-sac with a large enterolith in the cavity. Recovery was uneventful.

Case 5: September 20, 1898, I was called to see F. W., a boy of nine years, in the evening. I found the patient suffering considerable pain in the abdomen, not localized. The temperature was 105°, the pulse 140, the abdomen distended, and he evidently had just had a chill. There was no clear history of pain in the right iliac region. I suggested to the friends the advisability of calling in a surgeon. I was met by the response, "No surgeon shall ever put a knife into my boy." The next morning I called in one of our local physicians to see the case with me, and we decided that it was a case of general peritonitis, with no assignable cause. Four days after the first call, the patient having failed rapidly, and being seemingly almost *in extremis*, the parents consented to have a surgeon called. I sent for Dr Reed, of Cincinnati, and he diagnosed the case as being one of general peritonitis, probably caused by appendicitis. He operated at once and found a gangrenous appendix with an enterolith in the peritoneal cavity. The recovery was slow and at times life was despaired of, but he finally made a complete recovery.

Case 6: In December, 1896, I was called to see a case of what was diagnosed as catarrhal appendicitis. After four days' illness with gradual amelioration of the symptoms, he recovered. I was called to see him again in September, 1897,

with a similar attack. In the following April he again sent for me, under much the same circumstances; but the symptoms growing worse, I sent him to the hospital, where on the following day he was operated upon. The appendix was found in a mass of adhesions, enlarged and inflamed, the lumen open and containing traces of pus, but no enterolith. Recovery was uneventful.

Case 7: December 2, 1898, was called in to verify another physician's findings, which I promptly did, and referred them back. The case showed considerable distention and tenderness over the abdomen, with point of greatest tenderness over right iliac region. He had then been sick for three days. The next day the friends sent for a Cincinnati surgeon, who again referred the case back to the first physician. Then the friends delayed sending him to the hospital until 24 hours later. Finally on December 4 he was operated upon. The stump of an appendix was found, the rest of the appendix having entirely disintegrated. Recovery was uneventful.

SURGICAL APPENDICITIS

B. MERRILL RICKETTS, PH. B., M. D., CINCINNATI

The two words, appendix and appendicitis, appear to have been American, while from the Greek point of view they should be epityphylon and epityphlitis (Kuster, *Centralblatt fur Chirurgie*, Dec. 17, 1898). It is not probable that other words will ever be substituted for them, especially in America. The terms "peri" and "para" (upon and under inflammatory processes) should not be given much consideration within the abdominal cavity, as their differentiation is almost impossible without exploration. It is therefore wise to eliminate all words and phrases which are in the least confounding.

Appendiceal pain many times indicates conditions other than inflammatory. It would therefore be erroneous

to apply the word appendicitis to all the abnormal conditions of the appendix. However surgical methods should be as readily applied in one as in the other. Pain prompts the victim to seek relief, and 'tis pain which must be considered before rational means can be applied. Pain can be overcome with chloroform, opium, and their compounds, and this should be done in many conditions, but not often in painful conditions of the appendix. Far better apply hot-water bags until the cause of pain is determined, as the true condition is many times masked by medicaments.

While certain remedies will evacuate the bowel and therefore relieve more or less pain and distress by lessening the distention, it is as impossible to make the alimentary tract aseptic, or to evacuate the appendix of its contents (whether fluid or otherwise), as it is to remove the appendix itself by their administration. It is therefore fair to conclude that surgery, and not medication, must be applied.

The mildest abnormal condition of the appendix may be accompanied by a rise of several degrees of temperature, while the most desperate condition may exist within the abdominal cavity without any rise of temperature. While the use of the thermometer has resulted in much good, it has also resulted in much harm, for many remedies have been needlessly given in high temperatures, and much surgery neglected because of low temperatures, especially so in abdominal surgery.

Severe appendiceal pain and tenderness, with or without a rise of temperature, are sufficient indications for surgical interference, unless it be a very small percent of cases with a very mild first attack. This class of cases is the most difficult to determine, and for that reason is encroached upon (and justly so) by the conscientious, progressive, energetic surgeon. 'Tis more humane to subject the few of this class (say 5% or 10%) to what might be considered an additional risk, than to neglect the same 5% or 10% of the other

class, for the chances of recovery in the first (milder ones) are far greater than in the second (more severe ones). The application of these principles in 50 operations fully justify their assertion, and while different observers often make different deductions from the same examples, there should be no great discrepancy in generalizing.

The appendix has not been removed in ten cases (20% of the cases operated upon). Never has it been necessary to close any of the four gut perforations which were found at time of operation, or the one which appeared subsequently. No doubt many perforations are due to manipulation during the operation or after dressing, which may be too firmly packed.

There has never been a hernia result from any of these 50 operations. Neither has there been any pain or trouble in any of the cases in which the appendix was allowed to remain, several years having now elapsed with some of them.

Fistulas have existed for several months, alike in cases where the appendix was removed and where it was not removed. In but one has a fistula existed longer than six months, and that in a young lady whose appendix was not removed at the time of operation. It was necessary at the end of four months to enlarge the abdominal opening and pack with gauze, recovery being then complete.

Fig and tomato-seeds were found in one, a grape-seed in another, blackberry in another, and concretions of various shapes, sizes and number in others.

The time of operation has varied from 1 to 30 minutes, and age from 7 to 73 years.

In one case, a boy seven years old, operated upon during the first part of an attack, and the *fourth day* of that attack, dissolution occurred within 48 hours, general peritonitis having no doubt been established at the time of operation. The other death (two of the 50) occurred in the case

of a man 27 years old, who expired at the end of 30 days from subphrenic abscess.

One case, that of a woman 28 years of age, presented a most unique condition, exploratory operation finding an enormously distended pus-tube with appendix and ovary in a gangrenous condition, being no doubt the result of strangulation from pressure.

Incision is made over the tumefaction wherever it should be, and as long as necessary to facilitate thorough work and exploration. Experience shows that an appendix may be from 1 to 17 inches in length, and can therefore be the means of locating inflammatory or mechanic trouble at any point within the abdominal cavity, directly, or thoracic cavity indirectly.

Acute pathologic conditions of the appendix.

1. Inflammatory.
2. Mechanic.

Acute inflammatory may be perforating or nonperforating, with or without foreign bodies, and with or without rise of temperature or rigidity; probably never without pain and tenderness.

Pus may be within or without the appendix, or both.

CASE. Cause, *acute inflammatory*, white boy, 16 years of age, referred by Dr Beebe and operated upon 20 hours after first attack, severe pain and great tenderness with rigidity, temperature 101° to 102½°. Several ounces of very offensive pus escaped through the incision; the appendix, which was three inches long and perforated, was ligated and removed, the cavity packed with gauze and free drainage established. Recovery was rapid and uneventful.

Acute mechanic, with or without foreign bodies; may be sudden strangulation independently or collectively, or the appendix may be bound down by adhesions within a few hours.

CASE. Cause, acute mechanic (?), white man 27 years

old, previous health good; ate blackberries in large quantities on Sunday, rode excessively on bicycle on Monday afternoon, complained of appendiceal pain and nausea during Monday evening, continued to become worse until following Saturday evening when belly was opened and an ileocecal strangulation by a diverticulum was detected; this was divided without difficulty; the appendix, which was found to be greatly distended and included in the parts strangulated, was removed and found to contain large quantities of blackberry seeds. The probabilities are that the appendix became filled with the blackberry seeds on Sunday, and on Monday their presence was aggravated by the use of the bicycle, both resulting in pain and the severe vomiting, which no doubt produced the strangulation. The bowels never having been evacuated after Monday (the day of attack) would indicate that the obstruction by strangulation must have occurred on that or the following day, and it may be, but is not probable, that the appendix contained these seeds for some days or weeks prior to the strangulation. Then too, the use of the bicycle might have been the cause of the strangulation; this also is hardly probable, as the same amount of riding was necessary every afternoon, his occupation being that of a messenger to deliver the evening papers.

Chronic pathologic conditions of the appendix.

1. Inflammatory.
2. Noninflammatory.
3. Mechanic.

Chronic inflammatory, with or without foreign bodies; may be perforating or nonperforating. When perforating the contents of the abscess may or may not be evacuated through the appendix into the gut; the opening in the appendix may close, thus leaving the pus encysted; this cyst may rupture into the peritoneal cavity, into the gut or bladder, or it may appear at any point upon the surface of the

body or lower extremities. Again it may become absorbed or remain indefinitely, the chances for absorption being very meager indeed.

CASE. Cause, *chronic inflammatory*, white man, physician, aged 40 years, suffered for 20 years with what fellows of his craft considered to be intestinal indigestion, and stone in the kidney and ureter. There was marked tenderness, no rigidity, no fever, indigestion at times; operation more than two years ago. The appendix was found slightly adherent, seven inches long and about the size of a lead-pencil, with the distal end adherent low down in the iliac floor. After ligation with silk, the stump was cauterized with pure carbolic acid, and the walls of incision sutured with silkworm-gut. Recovery without difficulty.

Chronic mechanic, with or without foreign bodies, or gradually bound down or obstructed by new tissues. The existence of the various kinds of gut and omental hernia should always be considered as an important factor.

CASE. Cause, *chronic mechanic*, white woman 28 years old, well nourished and without history of previous similar trouble. Consultation with Drs Chandler and Insko, Mt. Olivet, Ky., who had for about ten weeks been relieving the severe appendiceal pain with morphin. There had never been a rise in temperature, no very great tenderness or rigidity, bowels moved without much difficulty, no reason for alarm at any time, but great doubt as to the cause of trouble; anesthetic chloroform. The appendix being without adhesions and found to be straight and hard, was removed after ligation of stump, which was cauterized with pure carbolic acid; incision closed with silkworm-gut and collodion; recovery rapid and uneventful. Upon opening the appendix, a mass of black dry fecal matter was found to extend from one end to the other about the size of the lead in a pencil and almost as round and hard. Here is a case in which the pain was

mechanic and made periodic with the filling and emptying of the gut with fecal matter or gas, or both, by pushing this dagger into the lower end of the sensitive appendix. There was absence of pus and adhesions, or any indication whatever of inflammation in any degree having existed at any time. The continued absence of pain for two years is the best evidence that the application of surgery was not amiss.

Noninflammatory, with or without foreign bodies, or old adhesions or strangulations.

CASE, Noninflammatory, white woman aged 50 years, suffered for several years, walked in stooping posture, no fever, no great tenderness or rigidity, pain at times very severe. Incision revealed the appendix adherent to the ovary, both of which were removed by Dr Edwin Ricketts, who kindly consents for this brief report. Recovery uneventful and relief now constant at the expiration of almost three years.

Attacks.

1. Primary.
2. Secondary.

Primary. First attack, whether of long or short duration.

Secondary. Two or more attacks at any time subsequent to the primary attack.

CAUSES.

1. *Direct*, when appendix is seat of origin.
2. *Indirect*, when encroached upon from other tissues and when due to injury from direct blow or otherwise.

Foreign bodies may remain within the appendix indefinitely without causing pain or other manifestations, just as gall-stones may remain within the biliary tract without causing pain or icterus or other manifestations.

CONCLUSIONS

1. Recovery is more certain when the operation is made early in the first attack.

2. Diagnosis is more difficult in the female, especially when pregnant.

3. Impossible to determine the character of the trouble without exploration.

4. Medicaments are without avail.

5. Incision through belly wall should not be closed in cases where pus is present, or where there is doubt as to slight bleeding.

6. Removal of the appendix is not necessary or advisable in all cases, especially when not easily discovered upon opening a pus-cavity.

7. 'Tis safer to allow a perforated appendix to remain than to lacerate a pyogenic wall in searching for it.

8. The ability of a remaining perforated appendix to cause subsequent trouble is in doubt as the process which is active enough to perforate the muscular walls of an appendix would seem active enough to destroy its mucous membrane.

9. There is but a very small percent of gut perforations under these circumstances which should be closed by suture, or otherwise, at time of primary operation, and still fewer which will require such thereafter.

10. All abscess cavities should be packed from the bottom with gauze, which will absorb serum, blood, and pus.

11. Appendiceal pain may be inflammatory or mechanic, either one being acute or chronic.

12. The presence or absence of abnormal temperature should not be considered if severe pain and tenderness are present.

13. Foreign bodies may be evacuated from the appendix into the gut without having caused any trouble, leaving the appendix undisturbed.

14. 'Tis safer to operate upon acute cases of appendi-

citis in their homes than to do so in the finest operating room if ambulances or trains must be brought into requisition to take them to that room.

15. A secondary operation, for the removal of an appendix which has been left undisturbed at time of opening the abscess is one of the most difficult in abdominal surgery.

16. Diseased ovary or tube may produce a pathologic appendix and *vice versa*.

17. Appendicitis may terminate in spontaneous recovery. This is however rare.

18. The appendix is subject to the diseases of the alimentary tract.

DISCUSSION

Dr H. G. Sherman, Cleveland: I do not rise to open this discussion, but rather to ask that the surgeons in the discussion of this paper state for the benefit of those who do not know whether in the initial attack of appendicitis surgical interference has been proved from authentic statistics advantageous over medical treatment, and whether the ice applications are not of great value at least in the initial stages. I ask the above for this reason. Within the past few months I have had the pleasure of witnessing five operations for appendicitis (5) in the hands of distinguished surgeons, and in four of these cases the appendix was found to be absolutely normal although the disease presented the classical symptoms in all of these cases. One of these cases was seen by Dr Gustav C. E. Weber, than whom no man in Ohio can speak with greater authority. He said at that time that he rarely, if ever, operated in a case of initial appendicitis and it is with the idea of getting information on this point that I ask that the surgeons in discussing this subject give us their opinions based on their experience relative to the benefits to be derived from medical treatment and surgical interference respectively.

Dr G. W. Crile, Cleveland: I think that we all feel under obligations for the investigations of Dr Scott, and for the bringing out of the very interesting points of the subject

on which he has spoken. I am very much interested in his tables. I think we may speak on appendicitis in a general way in this discussion. I believe that in this question of appendicitis experienced physicians must use their best judgment as to the time to operate. The diagnosis is not so often a cause of doubt, but the great trouble is when to operate, and this is the important question that now confronts us. Are those right who contend that every case is a surgical case? I am free to say that I think this doctrine entirely right. I believe it is better to have every case of appendicitis operated on at the appearance of the initial symptoms, when that patient is in charge of a physician who is attentive and who can recognize the danger-point for operation, and again when the patient can be placed under circumstances for receiving the proper care. But I believe that every patient may, when the initial symptom has appeared, wait in the hands of good physicians who are able to make the diagnosis and who are willing to watch the patient every few hours. I believe that these cases demand that the physician shall see him at least three or four times a day so as to watch every trend of the disease. I do not believe that there should be a difference of opinion between physicians and surgeons on this question. I believe that physicians who approve of operative interference and can recognize cases that are fit for operation ought to have the surgeon see the case in consultation. Especially if the surgeon is to take the responsibility of the case, he ought to have the right to aid the physician in coming to a proper surgical judgment. I do not believe that all cases require operation. I do not believe that there is any disease in which the personal judgment is more important than in appendicitis. There are cases in which I would operate at once, and there are cases in which I would not operate at all. There are cases in which we have to operate in the middle of the attack and others after the attack. With a patient who has had an attack of appendicitis the question at times arises, whether it is safe to leave in the appendix if he expects to be gone on a trip, particularly if he travels extensively and is out of reach of aid. The patient in reach of aid may wait until the initial symptoms appear and then be operated on. I believe that the status of the case is about as follows—if the physician and surgeon would use their combined experience in making up their minds when it is no longer safe to delay

and that the operation must be done, I believe that the patient's best interests will be subserved.

Dr C. A. L. Reed, Cincinnati: I have rarely listened to papers which interested me more than those which composed the symposium for this afternoon. The very practical question that has been canvassed in such a systematic way by Dr Scott is one that has needed precisely the consideration which he has given it. The question as to the possible congenital absence of the appendix has always been more or less of a bewildering one to the operator, and in making his search, he having gone as far as Pluto permits, stops for a moment and makes the suggestion to himself that perhaps there is no appendix in the case. The investigations of Dr Scott have settled the question with a reasonable degree of certainty, and we can now proceed in these cases upon the presumption that the appendix is present and that, if we fail to find it, it is because of the intervention of any one of the several conditions which may have hidden it away entirely. While the doctor was reading his very interesting paper I was reminded of a case upon which I operated eight or nine years ago, that of a young man, a lawyer from Tennessee, who had sustained his twenty-second acute attack. I operated upon him in the quiescent period. I opened the abdominal cavity and found a large amount of exudate around the *caput coli* and a large amount of recent exudate. I searched, and searched, and searched, for the appendix, but failed to find it; and in the midst of this dense mass, of unusually firm tissue it was exceedingly difficult to find the original site of the appendix, and it looked as though we would have to say that it had perished. I was about to abandon the case when I happened to put my hand into the abdominal cavity quite three inches above the incision and there I found my appendix alive and well, growing from the abdominal wall from which I removed it. In other words this was a case in which there had occurred a spontaneous implantation of the appendix to the parietal peritoneum and after the amputation had taken place the appendix continued to live from the nourishment derived from its new relations. That is perhaps another reason why the appendix is not found. However careful he may be the migration of the appendix may result in eluding the vigilance of the surgeon.

As to the calling in of the surgeon I would say that that question is first to be determined upon by a careful and full recognition of the disease with which we have to contend. There is an essentially surgical character to appendicitis with surgical symptoms. With regard to the promptness with which surgical intervention should be employed I hardly know any hard and fast rule nevertheless I know what I would do if I were the attending physician. As soon as the diagnosis was made I should shove the responsibility on the surgeon as soon as possible. I have known of a number of instances in which, notwithstanding the recovery of the patients, the attending physician has been subjected to the severest criticism on account of the delay, a delay which is to be laid to his door, although he may have had the timely suggestion, but did not heed it. I once operated in a case of this kind in which the fact was recognized that I was absolutely absolved from all responsibility for the result of the case, in which the parents, relatives and everybody connected with the case absolved me from responsibility because the symptoms had become so complicated that I could not be held accountable for the results. Therefore if I were the attending physician I should seek counsel in these cases as soon as symptoms of any gravity appeared. I believe that that is the safe method of procedure, not only from the standpoint of the physician but also for the welfare of the patient. Repeatedly have I been sent for in cases where I desisted from opening the abdomen. I recently saw a case in Hamilton in the practice of Dr Millikin, that of a young by who was seized with his first attack. The symptoms were quite pronounced, but at the time of my arrival there was some abatement. All the arrangements were made for the operation, but I said that we would wait a little while and see what would come of this case. We waited until the afternoon, and in the morning he was better. A laxative operated by evening, the symptoms disappeared and the boy recovered. He may perhaps have another attack but when he has another attack we can rely on his physician understanding fully its nature and significance, and intervention will be practiced without delay.

Mr. President, I appreciate fully the value of these discussions and I can conceive of none which will bear better fruit than those which have been presented in our hearing this afternoon.

Dr Mary J. Finley, Mansfield: Mr. President, I would like to ask two questions. We have had five papers on appendicitis in this meeting to which we have listened with the greatest interest. Does not this mean that this disease is vastly more common than it was a generation ago? If so, why is the appendix now more liable to degenerative change than formerly? I would suggest in answer, that this organ is a vistigial structure which has long survived its use in our anatomy, and nature may be preparing to discard it even without the aid of the surgeon. It is a theory of evolution that changes which are coming slowly for ages, sometimes arrive with a great leap, and variations appear in two or three generations that at other periods might require hundreds of generations to evolve. Such a transition period may be upon us, induced by changes in our food which is becoming more highly nutritious and concentrated, less bulky and is taken in smaller quantities at more frequent and regular intervals. Slight change in functional activity of the colon may lead to lowered vitality, degeneration and disappearance of this rudimentary organ.

Dr C. N. Smith, Toledo: I have been very much pleased and interested in the discussions which have taken place. About two years ago I operated on a case exactly similar to that reported by Dr Reed. A young lady was sent to me with the report from her physician that she had had many attacks of appendicitis, some six or eight having occurred within the last two years. As the patient described her attacks there was no doubt but that she had had appendicitis. I made my operation during the interval. Upon palpation I could not make out the appendix and upon opening the abdomen I could find nothing. There was no trace of the appendix. There were no adhesions anywhere about the cecum either retroperitoneally of anteperitoneally, and as far as I could discover there was no thickening which was traceable to the appendix. It was a case where the opening of the abdomen seemed imperative, and I gave some time to the search for the appendix, but absolutely failed to find any trace of it. I had figured it out in my mind that it was a case in which the appendix had gone on to obliteration. I will say however in the two years since that abdominal section the patient has had no more appendicitis.

As regards the relations of physicians and surgeons in

appendicitis, I firmly believe that every case of appendicitis should be looked upon surgically. I do not believe that every case should be operated upon, and I do not believe that we have arrived at a point where we can lay down fixed rules determining the time positively for operation in appendicitis, but the experienced surgeon soon after he gets his eye on a case can usually tell whether or not he wants to operate. I do believe that these cases which recover from appendicitis without operation are a misfortune to a community. You allow two or three cases of appendicitis without operation go on to recovery, in the practice of good physicians, and when a surgical case comes along the operation is postponed and the case dies. I recently saw in a small town three cases that recovered without operation, but there was another case of a young man in the same town about thirty years of age who was practically dying when I saw him, and in that case the doctor had said positively to the friends that an operation was imperative. Now what are you going to say to the friends of patients suffering from appendicitis? Are you going to advise operation at the proper time, or are you going to wait until the case is practically hopeless? If the patient above referred to had died, and fortunately he did not, it would have been impossible to have had an operation for appendicitis in that town for another year. It is absolutely impossible to operate upon a person in a community where cases have recovered without being operated upon. The surgeon should see the case and watch it, he should have the right to assume the responsibility and also have the right to determine when he should have the responsibility.

Dr Ricketts, Cincinnati: There is one point which has not been touched upon (and I was fortunate enough to hear the paper of Dr Scott) and that is that the progress of this disease after 12 years of age is much more acute. The assertion has been made on this floor that we should await certain developments, or certain circumstances before operating. You take patients who have reached 20 or 25 years of age and those are the cases which pursue an active course, patients up to the age of 12 years are quite rare. I merely want to say that after some experience in appendicitis I always look at this disease from a surgical standpoint, and after seeing the benefit following early interference (the

operation taking in many instances not more than 10 to 15 minutes) if I ever have one attack of appendicitis I shall never have a second.

Dr Arthur W. Johnstone, Cincinnati: There are two points which I will take up, *viz.*, the relative frequency of appendicitis in comparison with what it used to be, and *appendicitis obliterans.*

I came from the school in which McBurney was one of the demonstrators. He was an under-study of Senn. I entered the practice of medicine in 1876, looking for appendicitis because we had seen cases and had heard so much about them. I was practising in Kentucky in a small place and while there saw 15 or 20 cases of appendicitis, and for the population I should say that they were relatively as common then as they are today. Senn taught his boys to recognize this disease. I remember one case that I had under my care in 1876—you remember how long ago that is—in which the suppuration symptoms did not show up. The patient got well and today is a strong and well man, at least he was so some three or four years ago. I know of several other cases of the same sort occurring about the same time. None of them were operated upon, but the fact that they are really well does not influence me in my opinion as regards operation. In the attack if the symptoms are not specially pronounced give the man a chance, and I am free to confess that I do not always operate at the beginning of the second attack, but the second attack is scarcely over before I am at it.

In reference to *appendicitis obliterans*—I have been very much interested in the reports, and in thinking of my own experience. In one case that I remember the cecum looked as though it had never had any appendix attached to it. I thought that the appendix had slipped away, but after making a careful examination I found the tail and then the other portion of it. I am of the opinion that the appendix can be found when careful enough search can be made for it, unless it has been totally destroyed by the abscess formation.

Dr Thad. A. Reamy, Cincinnati: I suppose that in the absence of exact scientific knowledge as to the morphology of the appendix, we might assume with a fair degree of probability that it is a rudimentary remnant of our climbing ancestors and that, since it has become a rudimentary ele-

ment, it will eventually become extinct. And it is also perfectly natural to conclude that the further it becomes removed from its natural site, the more frequently it will be the seat of disease until it will ultimately become extinct.

It is possible some light may be thrown upon the subject of appendicitis if we will consider the improved facilities for diagnosing this disease. I am of the opinion that the wonderful facility with which we are able to open the peritoneal cavity and the very little danger attending that surgical procedure, have been the occasion of a number of unnecessary operations for this trouble. The number of gentlemen in our profession who have the necessary instrumental skill, and the necessary qualifications in every particular to operate for appendicitis make the danger from operation very small. I think in these cases the surgeon ought to be called in consultation with the general practician in the initial stage of the case, and that the surgeon ought not to be required to assume the responsibility after the diagnosis has been made without him. A great many side-lights come in from the statements of this gentleman who is so well qualified to operate. There is an assumption that some of us are qualified as surgeons because we have an amount of diagnostic skill and a general knowledge of pathology and physical diagnosis not possessed by the general practician, but this is a mistake, it is not true. There is no objection to calling in the surgeon, but the first man that ought to be called in consultation is the general practician because it is no use to deny (and I hope I will be excused for criticising for reasons well known to you) that the harmlessness of the operation because of the surgeon's ability to do it well, necessarily and unavoidably in many instances cause him to lean towards an operation, and it is not always true that the surgeon's judgment is wise. Now along this line allow me to say that I have known not one case, but personally have known and seen in consultation more than 30 cases that I can distinctly recall had all the diagnostic points in connection with this disease who were not operated upon, and not only did they not die at that time, but they did not die of the disease subsequently. Now this proves that there are quite a number of these cases which get well without operation. There is practically no danger in opening the abdomen, but there is no doubt that there are many of these cases which are operated upon that would recover just as

well if they were not operated upon. With all of our skill, and with all of our judgment, and with all of our safeguards against sepsis at the present time, and also with all of the precautions that can be taken, I want to remind you that there are cases which do not recover after operation and also that a number of cases justify us in asking judicious counsel, not surgical, at the beginning of the attack. Then in due time call the surgeon as the third party to the consultation.

Dr B. E. Sager, Cleveland: In discussing the question of appendicitis it is well to consider the relation of the physician to the surgeon. Each should have the implicit confidence of the other. The surgeon should be called in in the initial stage because we all know that it is by comparisons that we arrive at results. Dr Crile has given us a number of suggestions. He told me to explore the opposite side of the abdomen from which the appendix was located. I asked him for what purpose, and he said first to arrive at a comparison, and to divert the patient's attention from the disease as there will not be so much resistance from the muscles over the appendix on examining that part. As to the location of the appendix, you all know how to find McBurney's point midway between the anterior superior spinous process of the ilium and the umbilicus, but its location may vary. Just a word as to etiology. Dr C. B. Parker, of Cleveland, wrote an interesting paper in which he stated that it was not due to a solid body, as a grape-seed. His opinion has been confirmed by the surgeons. It may be due to a concretion, a fluid in the appendix or an extension of inflammation from the colon. This being the condition let us consider just for a minute the medical treatment. If local applications and counter-irritants control enterocolitis by drawing the blood to the surface thus relieving congestion; will they not be as effective in the initial stage of appendicitis?

Let me refer to a case which came under my observation in which the treatment given was the following:—a hypodermic of morphin was first administered, followed by a second hypodermic, and then antiphlogistine was applied continuously. Epsom salts were administered at intervals of one-half hour alternating with olive oil until an evacuation occurred.

Another question. Why will not ice control this inflammation? The inflammation has subsided by this

method in a great many cases. One writer says that we should operate in almost every case, and yet he claims that there is spontaneous recovery in some cases. The time is past when we are to jump at conclusions. The line of demarcation is made so plain by our authorities that it is unnecessary. While you are employing your remedies to abort the inflammation and resolution fails to occur in a short period consult the surgeon as to an operation. I saw a statement in the *New York Medical Journal* which you can take for what it is worth, but I do not think the *New York Medical Journal* would publish anything unless there was truth in it. It was to the effect that a certain surgeon had treated 80 cases of appendicitis and out of that number 77 cases recovered. Olive oil was administered by mouth at irregular intervals and an enema of olive oil with an occasional dose of Epsom salts for a period of a week. Resolution occurred the third day with an uninterrupted recovery.

Dr J. F. Baldwin, Columbus: I have taken a great deal of interest in listening to these papers, but have very little to say on this subject. I have removed the appendix between 200 and 300 times; in not all of these cases did I operate for appendicitis, but removed the appendix in connection with other abdominal operations.

Some ten years ago a prominent Boston surgeon reported a large number of cases of appendicitis collated from hospital reports, etc. Of the large number of cases thus reported 80% had recovered without operation. About the same time I collated some statistics from my own practice and presented them before the Central Ohio Medical Society. My experience at that time included something over 100 cases, and my results tallied almost exactly with those in the Boston cases, namely 80% had recovered without operation. For a long time I took pains to keep track of those unoperated cases, and I know of but two of them in which there was a subsequent attack, and in neither of these was operation indicated. I have no doubt that there have been other recurrences, but I have not learned of any.

The dangers of the operation are slight provided the surgeon can select his cases, the time of the operation, and his surroundings. Some months ago a prominent Western surgeon reported some 70 or 80 consecutive cases which he had operated upon without a death. His record was so

much better than mine that I wrote him a personal letter, congratulating him upon his results, and asked him if he had not selected his cases so far as not to operate on cases which were distinctly unfavorable; cases in which the operation had been delayed until there was a general purulent peritonitis present. I asked him point blank whether he had operated on that class of cases. I received a prompt reply to my letter, but no answer to my question. He wrote entertainingly in a general way on the subject, but did not say a word about nonselection of cases. I thought his dodging the issue was fully equivalent to his admission that he had selected his cases. In my judgment no such report can be regarded as honest because it is clearly misleading.

The case reported by Dr Smith was clearly one of that desperate class of cases in which a surgeon who is operating for statistics will decline to intercede. I have had several of them. Some of them have recovered, but the larger proportion have promptly died. I always expect to have such cases, as I do not believe the true surgeon should refuse to operate even in desperate cases, but I do not believe that cases of true general septic peritonitis ever recover.

Dr Reed has spoken of the location of the appendix. The surgeon must be prepared to find it anywhere. In one case I saw it in the thoracic cavity under the left collar-bone. It was not a case of appendicitis however but at a necropsy.

Concerning *appendicitis obliterans*, I have seen several cases of that character, but none so complete as that reported today. I had a case a few weeks ago in Tuscarawas County in which the appendix was entirely detached from the colon by an interval of from $\frac{1}{2}$ to $\frac{3}{4}$ inch. An abscess had formed some months before which had doubtless destroyed this portion of the appendix and had then discharged into the bowel. The trouble however had persisted until I removed the detached portion.

Another point as to not being able to find the appendix: I have never failed to find it when I have hunted for it, but in a great many cases I do not try to find it. I refer to that class of cases of acute appendicitis with abscess-formation in which I think it unwise to separate adhesions in search of the appendix. In the vast majority of these cases the appendix will give no further trouble, while, if it does, an interval operation will be attended with a minimum of danger. I had a case recently in which while operating on

a pus-tube I hunted in vain for the appendix, but just as I was expressing my surprise at not being able to find it, I recalled that I had removed it when removing an infected tube some years before from the same patient.

One word, although not in line with the papers, as to the method of operating on these cases. When we find a diseased appendix surrounded by adhesions, showing that it has been the site of previous disease, if we dig it out and cut it off in the usual way and close the opening in the bowel we run some risk of infection from the possible escape of a drop of mucus or feces on the peritoneum, while it takes some little time to close up the opening by the usual rows of sutures. For some time I have been treating these cases by ligating the mesoappendix close to the head of the colon, then cutting it off above the ligature and stripping it from the appendix with my fingers or forceps, taking with it the thickened peritoneum and sometimes a part of the muscularis. The appendix thus treated consists of little more than thickened mucous membrane. With the blunt end of a patent-eyed needle I then push in the tip of the appendix, so as to commence its inversion, and complete the inversion by the use of a long probe. The inverted appendix is thus pushed into the colon, as the finger of a glove may be pushed into the hand. I then thread one end of the catgut which I have used in ligating the mesoappendix, take a single stitch, or occasionally two, in the opening of the inverted appendix, and tightening the thread, draw the mesoappendix into apposition. A single thread of fine catgut, for I usually use No. 1 chromicised, thus answers every purpose and the operation takes but a very few moments for its completion. In several cases I have thus operated upon, enteroliths have been present, which however I have been able to force into the colon. In some cases the mucous membrane is so infiltrated that inversion is impossible, and then it must be removed in the usual way.

I wish to thank the gentlemen who have read these papers. I especially appreciated the paper on "Why we do not find the appendix." I had been led to believe that it was occasionally congenitally absent, but I am glad to learn the contrary.

Dr D. N. Kinsman, Columbus: It is very gratifying to see surgeons returning to their senses again. The conserva-

tive views of Dr Crile and Dr Baldwin are evidences that some surgeons do not cut every belly which they happen to meet. 80% of cases recover without operation. Not every case of acute pain in the right groin over McBurney's point is an attack of appendicitis. Nor does the opening of the abdomen and the removal of the appendix remove such a pain —for we have the reports of operations in which the pain continued until relieved by cathartics and enemas. The appendix had been removed and because the disturbance continued something else had to be done. Would it not have been wise to have done a little judicious work in diagnosis before the exploratory operation was made? The ease with which patients mostly recover from abdominal incisions has had the effect of displacing the art of reasoning from the accomplishment of some surgeons. When the incision has been made the appendix has to come out, and it ought to, first for the vindication of the operator, and second to protect the patient from future assaults because he happens to have an appendix—and a bellyache at the same time. It has been my lot to have seen some operations of this sort. They appear as operations for the removal of the appendix and such they were—but they were unnecessary operations. Again my reading has taught me there are cases in which an operation may cause death. When the intestines become paralyzed and the stethoscope does not enable us to recognize peristaltic movements in the distended abdomen, then the operator's hand should be stayed. It is surprising from what extremities a patient will recover some times. Richardson of Boston, was the first surgeon who gave clear statements on this point. In the son of a physician of Columbus this intestinal paralysis continued 21 days and he recovered, to undergo a successful operation a few weeks later. In a consultation, at which there were five surgeons urging an operation as the only hope, I stood out against the operation as removing the only hope the lad had for recovery.

Another case, a girl of 18, Dr Baldwin and I watched. The diagnosis was complete, and for days we watched with every preparation made for an immediate operation. She recovered and has for five years remained well. In another case under observation I consented to an operation at once. Dr Baldwin was with me in this case. He declined to operate because the abdomen was so fat that he believed the

chances of the patient were better without the operation than with it. The man made a tedious recovery but is as fat and as well now as ever. This man escaped with his appendix because it was covered by an abdominal wall probably eight inches thick. I don't know what would have happened had his belly walls been as thin as some others.

Now I do not wonder at the enthusiasm of surgeons, this *furor secundi*. They can, it seems, invade any cavity and inflict any traumatism—when infection is avoided—but no one can be sure that all the conditions of a complete asepsis are present and we often see the patient die septic in spite of what seemed at the operation perfect conditions. Under all circumstances there are 20 cases in a hundred which must be operated on. The indications for this will be clear and unequivocal. The surgeon and the physician alike recognize them. Every such case, I will go further and say *every* case, should have the care of a physician and surgeon as has been urged upon this floor. I have seen many cases of appendicitis in my individual career. Many have recovered. I regret today that some died who might possibly have recovered had the surgeon cut them. On the other hand some who died never had any hope when the disease was recognized.

One thing more; I cannot give my adhesion to the teaching that opium should be withheld from these cases, because it masks the true condition of the patient. Pain kills, and I know no more atrocious pain than that caused by a circumscribed or general peritonitis. The judicious use of morphin cannot conceal the conditions from a watchful physician or surgeon, but it can sustain the heart declining in force under the assaults of pain.

Dr Lorimer, closing: I did not quite finish my paper on how to deal with the appendix in pus-cases. I intended to say that appendicitis is a surgical disease, and the next thing that I intended to say was that all cases do not need to be operated upon, but I think the surgeon should be called in to be consulted. Osler says if the diagnosis is not sure in 24 hours he hands them over to the surgical ward and Dr Tyson says the same nearly, so this is worthy of consideration coming as it does from eminent medical men and not from the surgeon and it is not meant that every case is a case for operation.

There was one point brought out by Dr Smith of Toledo and that was it was unfortunate that two or three patients in a small community should get well from appendicitis without operation. For that reason alone we should have surgical consultation at the beginning of the case. I think the most important paper read today was the one on "When to call in the surgeon." The surgeon should be called in when the case is suspected to be one of appendicitis. Now surgeons do not always operate when they are called in. I regret that Dr Kinsman and Dr Reamy are the only practicians that we have heard from. If the surgeon is to be called in and take the responsibility of the case, he should be called in in the beginning of the attack and share the responsibility with the physician, and not be compelled to wait until the fulminating point and then have all the responsibility shoved off on him. It is a hard matter in a country practice to call in a surgeon. This is a matter that country people look upon as not to be done in a hurry. I remember the first time I took Dr C.A.L. Reed with me in consultation and I remember well when Dr Ricketts came up there. The more experience I have the quicker I call in the surgeon. In a country practice I have seen eleven operations out of a total of 27 cases.

SIXTY-FIVE CONSECUTIVE ABDOMINAL SECTIONS WITHOUT A DEATH, WITH CLINICAL AND PATHOLOGIC REPORTS

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It has often been said that the surgeon or physician can learn more from one failure than from a hundred successes. And yet, profitable for the future as is bitter experience, success has its own lessons and the careful analysis of any long series of successful cases with the view of determining what are the factors which in the main have conduced to these favorable results can hardly be without profit. Again if in such a series of cases thorough macroscopic and micro-

scopic examinations have been made of the various specimens removed we are able to some extent to determine the frequency of certain pathologic conditions and also their bearing upon the outcome in any individual case.

The 65 patients were operated upon as they presented themselves and no attempt was made to select cases. In presenting these tables then for your consideration, I would call your attention to what in my opinion are the most important factors upon which the favorable results depended, and I think these are to be looked for in a careful operative technic and the proper care of the patient both before and after operation. It is true that with experience there comes increased manipulative skill on the part of the operator and that this is a factor there can hardly be any doubt, but I have for a long time been of the opinion that the greatest danger to the patient lies not so much in the chance of defective surgical skill as in the possible carrying into the wound of pathogenic organisms with a resulting sepsis. Convinced therefore that prophylactic measures in this respect have in a large measure conduced to these successful results, I shall venture today to briefly outline the technic which we have followed and shall emphasize some of the points in which we have found our difficulties and our solutions of them.

THE ORGANIZATION FOR OPERATIONS

In order to carry out with any degree of certainty an aseptic technic in all operations, it is necessary for the surgeon to first organize his staff. He must not only have competent assistants and nurses, but each must be taught his or her special duties. To borrow an expression from the foot-ball field, the operator and his assistants must understand how to do "good team-work." With a systematic routine, each one having his place and his work clearly defined, there will be few hitches, and there will be less likelihood of a break in one link of the chain which would render the whole technic futile. As regards assistants I

have been especially fortunate both in numbers and quality, and I take this opportunity of thanking each one of the members of my staff for their effective work. As a rule the members of the staff are arranged as follows: The first assistant stands opposite the operator and helps him directly, and unless his hands are otherwise employed the instruments and sponges are handed to him. The second assistant (or if necessary a nurse) on one side of the table has charge of the instruments, while the third assistant looks after the sponges or dressings which may be required during the operation. The fourth assistant has charge of the anesthetic and devotes his whole attention to this duty. The third assistant takes cultures, if necessary, during the operation or makes microscopic examinations of tissues or fluids. The nurse watches for opportunities to be of service to the surgeon or his assistants.

With reference to the patient I shall speak of, (1) The care of the patient before operation, (2) The preparation of the field of operation, (3) The care of the patient at and after operation.

(1) Whenever it is possible, it is our custom to keep a patient under observation for a few days previous to an operation. In this way we can become acquainted with the condition of the various organs of the body. A thorough physical examination is made. The urine, and if necessary the blood, are carefully examined, and any indications by which her general condition may be improved and her powers of resistance proportionately increased are followed out. The bowels are kept regular and only light diet is allowed. For the 24 hours immediately preceding the operation the diet is reduced to milk and broths. As a rule, except when the patient is weak and needs stimulants, nothing is given by the mouth during the eight hours immediately preceding the operation. In this way many of the inconveniences which sometimes accompany the taking of an anesthetic are avoided. The bowels are moved thoroughly by an

enema before the patient is put upon the table. The necessity for this procedure will be evident to those who have operated upon cases in which it has been omitted.

(2) In order to obtain a practically aseptic field of operation the following procedures are carried out:

(1) A bath of soap and water and a vaginal douche of a 1% carbolic-acid solution are given daily for three days before the operation.

(2) The hair of the abdomen and pubes is shaved on the night preceding the day of the operation.

(3) The parts are given a thorough scrubbing with (a) soap and water, (b) alcohol and ether, (c) bichlorid of mercury (1 to 1,000).

(4) A poultice of green soap is applied for from one to three hours.

(5) The soap is removed by scrubbing with a brush and hot water.

(6) A compress of bichlorid (1 to 1,000) is applied, and is kept on until the patient is brought to the operating-table.

After the patient has been anesthetized and placed upon the operating table, the compress is removed and the following additional steps are carried out:

(1) The field of operation is scrubbed with soap and warm sterile water.

(2) It is sponged again with alcohol and ether.

(3) In some cases it is washed with solutions of permanganate of potassium and oxalic acid, as in the disinfection of the hands, and subsequently irrigated with warm sterile water or salt-solution.

(4) It is irrigated with sterilized salt-solution to remove any excess of sublimate.

(5) During the operation the patient is properly clothed, and every precaution is taken to prevent her from

being chilled. Over the fresh nightgown a warm wrapper is placed. Stockings reaching well above the knees are necessary for warmth as well as for the avoidance of unnecessary exposure. To the after-treatment I shall refer later.

PREPARATION OF THE OPERATOR AND HIS ASSISTANTS

We have found it of great service that both the surgeon and his assistants shall wear sterilized suits while engaged in the operating room. A complete change of costume has many advantages. Our operating suits are made of twilled muslin. They can be easily sterilized and are more suited to the high temperature of the operating room than ordinary clothes. Canvas shoes with rubber soles are worn. The suits are sterilized in the autoclave and are put on in the dressing room adjoining the operating room.

For the sterilization of the hands and forearms of the operator and his assistants, chemical disinfectants by themselves have been found to be almost valueless. We rely upon the following technic which has been submitted to bacteriologic tests: The operating-room suits with short sleeves having been put on, the hands and forearms are scrubbed vigorously for ten minutes by the watch with a stiff brush, previously sterilized by steam, and with green soap, or sterilized olein soap, the water used being as hot as can be borne and being changed at least ten times. In order to avoid any possible contamination from the necessity of turning the spigots off and on with the hands, I have had constructed an arrangement by means of which this can be done equally well with the feet. The excess of soap is washed off in hot water and the hands and forearms are then immersed for two minutes in a sterilized, warm, saturated solution of permanganate of potassium. They are next washed in a sterilized, warm, saturated solution of oxalic acid until the stain of the permanganate has completely disappeared, rinsed off in sterile water and finally are immersed in a solution of bichlorid of mercury (1 to 500) for

two minutes. After the cleansing of the hands is completed, sterilized rubber gloves are put on.

It is customary with us for the operator and any of the assistants who come near the field of operation to wear a small sterilized muslin cap. In this way the possibility of any dandruff from the head coming in contact with the wound is avoided.

PREPARATION OF INSTRUMENTS

The instruments are boiled for five minutes in a 1% solution of sodium carbonate. The wire basket containing them is then removed from the solution and the instruments are turned out into sterilized trays which contain sufficient warm sterilized water to cover them. Between operations which follow one another in rapid succession, or if some of them by chance have come in contact with nonsterile material during an operation, the instruments, after being carefully washed in cold water, are quickly sterilized in the boiling soda-solution. The procedure is actually timed by a watch kept hanging up in the operating room.

Trays made of thick glass or porcelain-enamelled ware are employed to keep the instruments in at the time of the operation. They are first washed thoroughly with water and then filled to the brim with an aqueous solution of bichlorid of mercury (1 to 500), which is allowed to remain in them for an hour before they are needed for use. Just before the operation they are finally rinsed out well with sterile water and, after being placed upon the table, are filled with enough sterilized water to cover the instruments. If they are required for a second operation following closely upon the first, they are cleansed by rinsing them out with cold water to which hot water is cautiously added, then with a 1 to 500 bichlorid solution, and lastly with sterilized salt-solution.

SUTURES AND LIGATURES, SILK, SILKWORM-GUT, CATGUT AND SILVER WIRE

Surgeon's cable-twist is used in five sizes. The ligatures are wound on glass reels, and the reels are placed in the heavy glass tubes, the mouth of each tube being plugged with ordinary cotton batting. The empty tubes plugged with cotton are previously sterilized in the hot-air oven. It is important not to use absorbent cotton for the plug as it will take up moisture from the air and fungi will be more likely to grow through it. The tubes with the ligatures in them are sterilized in the Arnold steam sterilizer, or the autoclave on two consecutive days for half an hour each time. Just before using we sometimes reboil the ligatures for two minutes in plain water. *Silkworm-gut* is sterilized in the same way. Silver wire is sterilized by boiling. *Catgut.* We have been using with much satisfaction Kiliani's dry catgut in different sizes, also St. John Levans and Van Horn's chromicized catgut. So far as we have been able to judge from the number of cases in which we have used these catguts they have been on the whole very satisfactory. The only criticism that we have to offer would be that in using the large size we have found that the suture sometimes does not become absorbed but gradually works its way to the surface and is then discharged. In some instances a drop or so of pus will be present as the result of this shedding of the suture. In other cases a small amount of sanious fluid will at times escape.

Absorbent cotton, absorbent gauze, bandages and towels are sterilized in the autoclave.

We use sponges made of sterilized gauze. (The gauze is cut in different sizes, the edges folded over and hemmed so that no loose threads will be left in the field of operation. They can be easily sterilized by means of steam heat immediately before the operation. In this way we are able to do away with the tedious preparation of marine sponges,

and it is never necessary to use the same sponge for another operation as the gauze sponges are very cheap).

Irrigation. We irrigate entirely with normal salt-solution. The solution is poured into the abdominal cavity directly from the glass graduates.

Powder. The powder that we use for putting on a wound is iodoform or iodoform 1 part, boric acid 7 parts. These are placed in ignition test-tubes and then sterilized in the autoclave.

Drainage. We have not employed a glass tube for the last five years. Whenever it is necessary to drain we use strips of plain sterilized gauze, which take care of any bleeding which it has been impossible to control by means of ligatures during the operation. We also drain with gauze in those cases in which there has been a rupture of the bowel and in which it has been exceedingly difficult or impossible to close the tear.

Postoperative Care of the Patient. After every abdominal section the abdomen is thoroughly washed out with sterilized salt-solution after which from 300 to 500 cc. of salt-solution is left in the abdominal cavity and the patient is placed with the head low, in the postural position for drainage for 24 hours, as advised by Dr Clark. Immediately after the operation the patient is put to bed and kept in the recumbent position, and closely watched until she has fully regained consciousness. Every precaution is taken to keep up her strength. For the prevention of shock strychnin is given hypodermically and enemas of strong black coffee two hours apart. After the operation, to counteract any symptoms of shock, we give the patient 1-30 of a grain of sulphate of strychnin every two hours for six doses. In the first two doses we put also 1-75 of a grain of sulphate of atropin. The strychnin is then given every three hours or every four hours in doses of 1-40 or 1-60 of a grain accord-

ing to the condition of the patient. Before the patient leaves the operating table she is given an enema consisting of 1-30 of a grain of sulphate of strychnin with 20 grains of ammonium carbonate and two ounces of brandy in a liter of salt-solution. In every case she is also given by rectum two ounces of black coffee in two doses an hour apart on her arrival in the ward after the operation. Every three to six hours after this she is given a nutritive injection, which is as follows:

Peptonized milk.....30 cc. (ʒi);
Whiskey.....30 cc. (ʒi);
The whites of two eggs;
Common table salt, 1.5 (grs. xxiv).

We endeavor to avoid any exposure to draughts in this condition of lowered resistance as it may easily prove to be the exciting cause of a serious bronchitis or pneumonia. Hot cans are placed around the patient in the bed between blankets. Fluids or other foods by the stomach are not given during the first six or twelve hours, except small quantities of toast water or warm water at intervals of from 15 to 20 minutes. As soon as the nausea has ceased and the bowels have been well opened we then give the patient nourishment by the mouth, beginning with small quantities of milk and lime-water, in the proportion of two parts of milk to one part of lime-water, slightly increasing the amount of the former every day, and diminishing the quantity of the latter until the patient is taking 3 parts of milk to one part of lime-water. We do not give cold water to drink if she is thirsty as in our experience it is not nearly so efficacious as hot water, and with ice or cold water she is never satisfied but is always asking for more. Besides this the ingestion into the stomach of much cold water soon causes nausea and may thoroughly upset the digestion and thus add considerably to the discomfort of the patient. It is seldom that we have a patient complaining much of thirst

following an operation. If this however is distressing, we are often able to relieve it by giving sips of hot water or by washing out the mouth with warm water at intervals of every hour or so, or by giving an enema consisting of 500 cc. of tepid water several times during the 24 hours. After the first or second day if the patient complains still of nausea we are sometimes able to relieve it by giving two or three tablespoonfuls of very hot water containing 5 to 10 grains of bicarbonate of sodium to the ounce of water. We repeat this at times every hour or so until the nausea ceases, or supplement it with a mustard leaf over the epigastrium.

Drugs. We do not use morphin or any of its derivatives as a routine measure for pain following an operation and always try other procedures before resorting to morphin. We find at times, if the patient is very nervous, she will frequently be relieved by rectal injections of an ounce or two of milk of asafetida or of 20 to 30 grains of potassium bromid. If this does not relieve the restlessness or if the patient is suffering with severe pain, we do not hesitate to give the deodorized tincture of opium in 20 to 30 drop doses by the rectum or 1-6 to 1-4 of a grain once or twice of morphin hypodermically. This however is never given as a routine treatment.

Bowels. The bowels as a rule are opened on the second day, sometimes on the third day. We generally accomplish this by giving the patient two grains of calomel by the mouth the morning after the operation and eight hours after this an injection of two ounces of glycerin high up the rectum, to be followed in two hours by an injection of a pint of soap-suds and warm water. If this is not effectual within two hours after its administration we then give an injection of

Plain warm water, 500 cc. (oi);
Olive oil, 60 cc. (℥ii);
Turpentine, from 2 teaspoonfuls to a tablespoonful.

This latter injection is repeated every two hours for two to three doses until some effect has been produced. If no

fecal movement follows the last injection we then begin with dram doses of Epsom salts by the mouth every hour until three or four doses have been taken. If this does not prove effectual by 7 or 8 o'clock the next morning, we then give a Seidlitz powder, or employ again the injection of water, olive oil and turpentine. In some cases we find it necessary to give a third of a bottle of the effervescent citrate of magnesium every three hours until 8 ounces have been taken. Between the doses of magnesia, we frequently employ rectal injections.

Catheterization. Patients are catheterized as a rule every eight hours. We encourage them to pass urine and in some instances it is not necessary to catheterize them at all.

Position. As a rule we endeavor to keep the patient in the dorsal position the first 12 hours following operation, but if she complains, especially of pain in the back, she is turned on her side with pillows to support her back for periods of five to ten minutes at a time, several times during the 24 hours. This procedure will often give great relief.

Tympanites. If any special amount of tympanites occurs we place the rectal tube in the rectum for half an hour to an hour at a time; as a rule this will relieve the patient. If this does not succeed we often give an injection of sweet oil, water and turpentine, and apply over the epigastrium at the same time a mustard leaf or a warm application, such as a turpentine stupe.

In conclusion I would say that it is certain that serious septic infection could hardly have been avoided through a series of 65 cases had not the maintenance of asepsis through a careful technic been in every case insisted upon. I feel that the use of sterilized rubber gloves and sleeves, and of the cap for the head largely diminishes the danger of infecting the wound. I think also that the irrigation of the abdominal cavity with hot salt-solution does much to

prevent shock and to minimize the virulence of any septic poison which may be present at the time of operation.

THE CLINICAL AND PATHOLOGIC REPORT OF SIXTY-FIVE CONSECUTIVE ABDOMINAL SECTIONS

In the 65 cases the oldest patient was 57, the youngest 17, the average age being 31 years, 43 were married, 16 were single, 6 were widowed. The chief clinical symptoms were as follows, many patients showing several of those symptoms:

Pain in lower part of the abdomen was present in 54 cases.

Backache was present in 30 cases.

Dysmenorrhea was present in 30 cases.

Leucorrhea was present in 19 cases. In 2 cases this was of specific origin.

Menorrhagia was present in 19 cases.

Metrorrhagia was present in 1 case.

Frequent and painful micturition was present in 6 cases.

Irregular menstruation was present in 19 cases.

Scanty menstruation was present in 2 cases.

Symptoms due to organic heart lesions were present in 3 cases.

Dyspareunia was present in 1 case.

Cases in which the lateral structures could not be made out without anesthesia, 23. In these 23 cases the examination under anesthesia confirmed the results of the examination without anesthesia, except that in five of these 23 cases the tubes and ovaries were found to be adherent on both sides, whereas at the examination without anesthesia only one side was found to be involved.

Average time of anesthesia 2 hours and 9 minutes. Longest time, 3 hours and 15 minutes. Shortest time, one hour and 20 minutes.

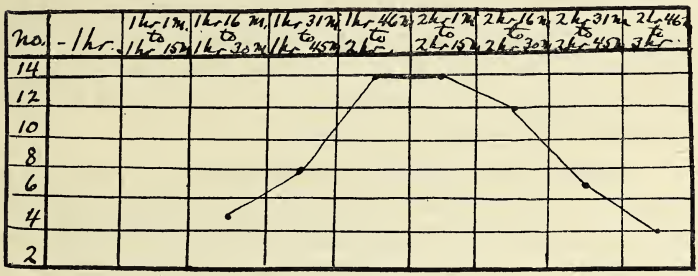
Average time for total number of operations, 42 1-3 minutes.

Average time of operation, 1 hour and 38 minutes. Longest time, 2 hours and 50 minutes. Shortest time, 39

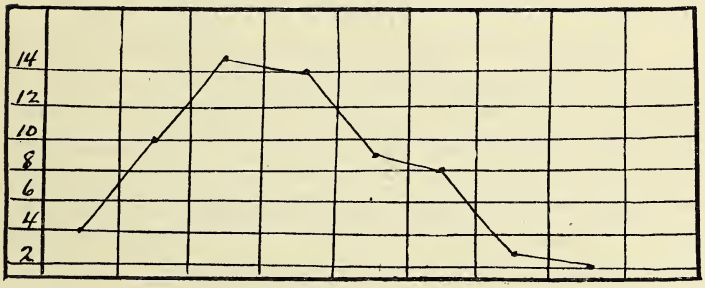
minutes. Average time of operation for total number of operations (193) 33 minutes.

COMPOSITE ANESTHESIA AND OPERATION CHART

Time of Anesthesia:



Time of Operation:



Results. In all 65 cases the patients recovered.

Irrigation. In every case the abdominal cavity was irrigated with salt-solution.

Removal of vermiform appendix in 14 cases.

Highest temperature, 103.5° F. Lowest maximum T., 99.4°F.
Highest pulse, 144. Lowest maximum P., 90.
Highest respirations, 44.

Highest average maximum T., 100.9°F.
Highest average maximum P., 107.3.
Highest average maximum R., 29.8.

The *bowels* were opened on the day after the operation, except in one case in which they were opened on the second day.

Urinary analysis. Albumin was found in 8 cases and in 3 of these granular and hyaline casts were present. In one of these cases the albumin and hyaline casts were only demonstrated after the administration of the anesthetic.

Nausea and Vomiting. In 45 cases there was a slight amount of nausea and vomiting during the first few hours after anesthesia. In no case was it excessive and the symptom generally ceased as soon as the anesthesia had worn off In 20 cases there was no vomiting.

Opiates. Nine cases received deodorized tincture of opium by rectum in from 15 to 20 drop doses. The total amount received by these 9 cases was slightly over four fluid drams. 7 cases received hypodermic injections of morphin in doses of 1-8 to 1-4 of a grain. The total amount given to all 7 cases being 2½ grains.

Suppuration. Suppuration of the abdominal wound occurred in 3 cases. In two it was slight and was confined entirely to the skin. In the discharge from one of these cases the *staphylococcus pyogenes aureus* was demonstrated. In one case there was a considerable amount of purulent discharge from the lower angle of the wound, which did not however involve the deeper tissues. In this case the *staphylococcus pyogenes aureus* was found in the pus.

Drainage was carried out in only *one* instance. In this case we drained through the vagina and also placed one piece of gauze in the lower angle of the incision in the abdomen. The large pus-sac that was present and that it was impossible to remove communicated with the peritoneal cavity and the vagina at the same time.

In attempting to open the sac through the vagina, an opening was also made in the peritoneal cavity. Thus as the sac would drain its contents into the peritoneal cavity, we evacuated the sac by the vaginal puncture.

The patients with two exceptions sat up in bed on the 18th day and were out of bed on the 21st day. In the two

exceptions the patients sat up in bed on the 26th and 27th days respectively. Greatest number of days in a given case in hospital, 68. Fewest number of days in a given case in hospital, 22. The average number of days in the hospital was 32 1-3. Convalescence was interrupted in 3 cases by a slight attack of bronchitis.

Pus was found at the time of operation macroscopically in 8 cases; microscopically in 10 cases.

CLINICAL DIAGNOSES

Abscess (tuboovarian)	5
Appendix, vermiform, abscess of	1
Appendix, vermiform, enterolith in	1
Appendix, vermiform, flexure of	1
Appendix, vermiform, adhesions of	13
Bartholini's gland, abscess of	1
Breast, fibroadenoma of	1
Cervix, lacerated	11
Cystitis, chronic	2
Cystoma, ovarian multilocular	2
Cystoma, ovarian papillary (double carcinoma)	1
Cystoma, ovarian papillary (single carcinoma)	1
Cyst, subperitoneal	1
Endometritis	7
Endometritis with stenosis	22
Epilepsy (menstrual)	1
Follicular hypertrophy of ovaries (cystic)	24
Hematosalpinx	1
Hemorrhoids, external	1
Hernia, ventral	1
Hydrosalpinx	3
Labial cyst	1
Myomata of the uterus	5
Omentitis	3
Oophoritis, or perioophoritis	7
Ovaries, prolapse of	1
Perineum, lacerated	1
Pyosalpinx (single)	1
Pyosalpinx (double) with pelvic peritonitis	5
Relaxed vaginal outlet	11
Descensus of uterus	1
Retroflexion of the uterus	19
Retroversion of the uterus	12
Salpingitis and oophoritis, chronic adherent	30
Total	198

OPERATIONS

All the operations were performed in Lakeside Hospital, and the technic recommended is that practiced in the gynecologic department of the Lakeside Hospital.

Appendicectomy	14
Colporrhaphy, anterior	1
Dilatation and curetment	31
Dilatation with vesical balloon (under anesthesia)	1
Fibroadenoma of breast, removal of	1
Hemorrhoids, removal of	1
Herniotomy	1
Ignipuncture of ovaries	23
Myomectomy	5
Omentum, portion removed	3
Ovaries, resection of	8
Pelvic adhesions, separation of	14
Perineorrhaphy	7
Salpingectomy, single	2
Salpingo-oophorectomy, single	13
Salpingo-oophorectomy, double	30
Sebaceous adenoma of *labium majus*	1
Suspension of uterus	29
Trachelorrhaphy	7
Vaginal puncture	1
Total number of individual operations	193

Total number in which the abdomen was opened, 65.

Abdominal operations alone	27
Abdominal and plastic operations combined	38
Appendix vermiformis removed	14
Adherent vermiform appendix separated	2
Myomectomies	5
Myomatous tumors removed in above myomectomies	13
Suspension of uterus with separation of light adhesions. (This case was operated on under cocain anesthesia)	1
Number of cases in which the same operative procedures were carried out	10

In making up our pathologic protocols we are in the habit of following as a routine special forms which we have had printed for the purpose.

Our forms are printed so that the following points can be dealt with in every case.

1. Uterine and Cervical curettings.

Name. Date of Operation. 1. Superficial Epithelium. 2. Utricular Glands. 3. Glandular epithelium. 4. Stroma. 5. Vessels. 6. Muscle. 7. Cervix. Diagnosis. Examined by Dr ..... Remarks.

2. Ovaries and Tubes.

Name. Date. Hospital No. Service No. Autopsy No. Laboratory Record No.

Tubes and Ovaries. Ovary.

A. Gross appearances and measurements. (1) Shape. (2) Size. (3) Weight. (4) Dimensions. (5) Color. (6) Consistence. (7) Appearances on section. (8) Gross appearances of *corpora lutea, hemorrhagica* and *albicantia.* (9) Cortex in gross. (10) Medulla in gross. (11) Gross pathologic alterations, such as cysts, hemorrhages, infiltrations, etc.

B. Microscopic appearances. (1) Peritoneum and germinal epithelium. (2) Cortical substance. (3) Medullary substances, *(zona vasculosa).* (4) *Tunica albuginea.* (5) Young Graafian follicles. (6) Old Graafian follicles. (7) Blood-vessels. (8) Lymph-vessels. (9) Nerve-cells and nerve-fibers. (10) Hilum of the ovary, including remains of Wolffian body. (11) Pathologic alterations, such as degenerations, hypertrophies, hyperplasias, cyst formations, neoplasms, hemorrhages, inflammations, infections, anomalous development, etc., etc.

Fallopian Tube.

A. Macroscopic appearances. (1) Size by actual measurement. (2) General appearance. (3) Patency. (4) Contents. (5) Gross pathologic lesions, *e. g.*, adhesions, hemorrhages, tubal pregnancy, inflammations, suppurations, cyst formations, etc.

B. Microscopic Appearances. (1) Longitudinal folds, main and accessory. (2) Ciliated epithelium. (3) *Strata propria* in isthmus, ampulla and infundibulum. (4)

Submucosa, (b) Muscular coat, (1) Inner circular, (2) Outer longitudinal. (c) Peritoneal covering. (1) Cells. (2) Subperitoneal infiltrations, etc., (d) Pathologic findings in microscopic sections, other than those included in above description.

Drawings.

PATHOLOGIC DIAGNOSES

Appendicitis	6	
Appendix, normal	1	
Appendix occluded	1	
Endometrium, normal	2	
Endometritis interstitialis	7	
Endometritis glandularis hypertrophica	6	
Endometirtis glandularis hypertrophica et interstitialis	2	
Endometritis glandularis hypertrophica et hyperplastica	3	
Endometritis glandularis hyperplastica et interstitialis	1	
Myoma interstitial and subperitoneal	5	
Omentitis	3	
		37

OVARY

Abscess (single)	3	
Abscess (double)	1	
Cystocarcinoma papillary (single)	1	
Cystoma papillary (double)	1	
Cystoma (glandular)	2	
Follicular hypertrophy	6	
Normal ovary	1	
Oophoritis (single)	4	
Perioophoritis (single)	16	
Perioophoritis (double)	19	
		54

TUBE

Hematosalpinx	2	
Hydrosalpinx (single)	1	
Hydrosalpinx (double)	1	
Normal tube	1	
Perisalpingitis (single)	9	
Perisalpingitis (double)	6	
Pyosalpinx (single)	4	
Pyosalpinx (double)	8	
Salpingitis (single)	9	
Salpingitis (double)	9	
Salpingitis (double tubercular)	1	
		51
Total		142

In all of the pus-cases coverslips were made and culture-tubes were inoculated, but only in four instances did we obtain any bacteria; in three of these the organism strongly resembled the gonococcus and in one case the *staphylococcus pyogenes aureus* was found, by coverslip examination only. Nothing grew on the tubes. It is to be remarked that in the inflammatory conditions of the tubes and ovaries large numbers of eosinophiles had infiltrated into the tissues.

Finally I wish to express my thanks to my assistant, Dr Wm. H. Weir, for valuable assistance in the preparation of the pathologic protocols, and also to my colleague, Professor Wm. T. Howard, for his kind supervision of this work.

DISCUSSION

Dr C. A. L. Reed, Cincinnati: We feel very grateful indeed to Dr Robb for the thorough study and classification of the products of these operations which he has made. Too much of case-recording is done upon the macroscopic appearance and there are consequently many important features which escape consideration, and there are many defects in records. I simply wish to emphasize the important lesson that is implied in the paper in that particular.

Dr Wm. H. Humiston, Cleveland: Dr Robb's paper, as Dr Reed has said, is an excellent one. A thorough pathologic study of these cases is very important and if Dr Robb had the time to read the paper entire he would undoubtedly have spoken of, and laid considerable stress upon the importance of the examination of the scrapings from the uterus. We have made many examinations in which there was no evidence of serious disease of the uterus, but upon examination of the scrapings microscopically have found evidence of malignancy. In cases above the age of forty, all scrapings should be examined microscopically, and frequently you will find evidences of malignant disease of the uterus. Then usually you are in time to make a complete operation soon, whereas if you allow the case to go on and involve structures outside of the uterus it will be everlastingly too late to hope for permanent results from operative

procedures. In our work we make it a rule to examine all cases demanding curetting, and especially the cases above the age of forty. Drainage is not used in my clinical or private work. I do not believe that it is necessary and my mortality is reduced markedly since abandoning it. Where we have adhesions of the intestines and omentum in which there are left large areas of denuded tissue and there is oozing from a great many points, I use the strips of iodoform-gauze quite firmly packed in, and allow them to remain several days. Drainage as drainage I do not use, and have not done so for three years, and my mortality has lowered. In the next dozen cases that Dr Robb operates upon he may have a loss of 50%. It frequently happens to an experienced operator to have a run of 40 or 50 cases without a death, and then lose three or four in succession. I had three cases which resulted fatally near the close of the year's work, spoiling a long series of uninterrupted recoveries. This year so far I have not had a death and I have had 22 operations, all but four being pus-cases, but it is a long time before the first of January, 1900, and what the result then will be no one can determine. The length of time patients are under anesthesia is a very important factor to be considered and the shorter you can make that period consistent with a good operation the better. An operator who is dexterous and at the same time thorough, will have better results than the man who has the abdominal cavity open a long time.

Dr Robb, closing: I wish to thank the gentlemen who have discussed my paper for their kind remarks. With reference to draining, I now employ it much more rarely than I formerly did. The abdominal cases in which I still use drainage are those in which it has been impossible to control the bleeding by the use of ligatures and even then the gauze is left in more for the purpose of compression than for drainage *per se*. Even when there is a considerable amount of oozing I generally fill the abdomen with salt-solution, and place the patient in the postural position. In this way it seems to me that the pressure exerted by the weight of the fluid has a considerable influence in checking the oozing. With the technic to which I have briefly alluded in my paper we have now had 82 consecutive unselected abdominal sections without a death. Of course everyone knows that at any time one may meet with a series of un-

favorable cases, in which, although every possible precaution may be taken, fatal results will ensue. We feel now however that our present technic enables us to bring about a successful result in a certain number of cases that would have otherwise not resulted favorably and thus raise the percentage of cures. In conclusion I would say that I have been unable to find in the American literature any reference to so long a series of unselected abdominal sections without a single death.

OBSERVATIONS ON THE SURGERY OF THE NECK BASED ON CLINICAL AND EXPERIMENTAL EVIDENCE

GEORGE W. CRILE, M. D., CLEVELAND

(STENOGRAPHIC REPORT)

The following observations are the results of experimental work on dogs:

Experimental evidence directed toward a comparison of the effects of hemorrhage from the arteries and veins of the neck. In hemorrhage from the veins we have a strikingly different result from that which occurs in bleeding from the arteries. In venous hemorrhages the blood-pressure immediately sinks. Experimentally as well as clinically hemorrhage from the veins of the neck is much more striking than hemorrhage from the arteries.

Closing the arteries. In operations on the head experimental evidence has shown that the arteries (the carotids) may be closed temporarily for a considerable length of time and then opened without any marked disturbance. So far as the blood-pressure of the brain is concerned it is safe to close both carotids simultaneously in order to control hemorrhages in operations on the head.

Method of closing the arteries. By using a special apparatus it is very easy to close the arteries effectively, so that there will be absolutely no hemorrhage in the area of their

distribution. That is to say, the closure of these arteries must be done carefully. I wish to call attention to a fact, that is very frequently overlooked, that the blood-pressure in the artery is very much less than is generally supposed, and in order to close it, very little force is required, very much less than is generally used. In tying a ligature around an artery it must be remembered that very slight force is necessary. In closing the carotids I use a screw-clamp, with a protection on its blades, which will effectively control the bleeding. This may be allowed to remain on until the operation is completed and upon removal of the clamps no harm has been done.

Experimental work on animals in reference to histologic changes which take place in the vessel-wall from the clamping. The effects of clamping the vessel-wall are in animals nothing more than a compression of the histologic elements of the vessel-wall. After clamping for 24 hours nothing more can be seen than a mere pressing together of the histologic elements of the vessel-wall and occasionally the endothelial elements are somewhat separated. There is no clot formed at the point of clamping. There is no embolus created in the peripheral circulation, so that it seems absolutely safe to close arteries in this way in operations on an area supplied by these vessels, the same as you do in closing vessels in performing an amputation.

In reference to intubation as compared with tracheotomy. It is experimentally proved and clinically verified that a mechanic pressure exerted upon the mucous membrane of the larynx will cause a reflex temporary paralysis which will inhibit respiration. If this stimulation is applied still more it causes an inhibition of the heart. The trachea is not endowed with any such physiologic function. No amount of stimulation on the trachea can affect the heart or respiration. Those who do laryngeal intubation in children have noticed in almost every instance that at the

moment the tube is introduced there is a temporary cessation of respiration. Now the child does not cease to breathe temporarily on account of its own struggles. The same thing would happen if the tube was introduced under anesthesia. Occasionally it has happened that the child has suddenly died. In these cases the cause of death has usually been ascribed to suffocation. The moment this occurs the general inference has been that the tube has pushed down the membrane in front of it. Now this is wrong, and I wish to call attention to the difference of symptoms in reflex inhibition and obstruction. I wish to call attention to the fact that you cannot cause sudden death by sudden obstruction of the larynx. In obstruction respiration will go on, and not only will it continue under these circumstances, but will do so with renewed force. The ordinary muscles of respiration will be brought into play first and then the extraordinary muscles, and under these circumstances a human being will live anywhere from three to eight minutes. In reflex inhibition cessation comes on instantaneously. Instant death means instant inhibition. The Germans have observed the same thing in performing laryngectomy. The moment the larynx is removed from its site that moment the patient goes into collapse. The cause of this is, that in this operation the superior laryngeal nerves are the last severed, or in the last stages of the operation have been dragged upon, thus causing inhibition of the respiration and heart. In every operation on the larynx or neck it is well to bear in mind this reflex nerve-area. How many times have physicians cut down upon the larynx with a view of removing a foreign body and just as they were in the act of grasping it the patient would collapse on account of the operator having made pressure on this reflex nerve-area.

Removal of tumors from the neck. The method of closing the arteries is of great value in the removal of tumors from the neck and it may be done with safety. Enormous tumors of the neck may be dissected out bloodlessly after first

clamping the carotid arteries. Every physician recognizes the necessity of decreasing the blood-loss. And not only is the blood-loss dangerous and undesirable but you cannot see the anatomic structures when the field of operation is filled with blood.

A word on the question of anesthesia. I would call your attention to the fact that the peculiar endowment of the superior laryngeal nerves and laryngeal mucosa whereby reflex inhibition is so quickly and so fatally produced (and general anesthesia does not offer any protection against such reflex inhibition) may be overcome by the use of cocain or eucain. This absolutely prevents such reflex inhibitions in manipulations of the mucous membrane.

As to general anesthesia. I wish to call attention to the fact that while chloroform and ether do not cause paralysis in the sympathetic area, these anesthetics are not safe where there is a degree of obstruction. The ordinary muscles of respiration are not paralyzed by general anesthesia. In cases of obstruction an operation is hardly indicated in any stage except in a case where the extraordinary muscles of respiration are called into action in order to supply oxygen to the system. If an anesthetic is given in such conditions it is almost certain that you will paralyze these extraordinary muscles of respiration and you will have sudden death before complete anesthesia has been reached.

DISCUSSION

Dr L. B. Tuckerman, Cleveland: I do not wish to discuss Dr Crile's paper particularly. There is a saying that a prophet is not without honor save in his own country but that is not true with us in Cleveland, for we have honored Dr Crile's patient work in the physiologic laboratory, and every one of his conclusions has been the result of long and patient investigation.

I wish to say that I have twice seen the Doctor clamp the carotid arteries with the clamps of his own devising, once for the removal of a sarcoma of the hard palate, a thing

almost irremovable under ordinary circumstances by reason of excessive hemorrhage, and the second time for the removal of an enormous tumor of the neck, that had pressed the trachea to one side producing by pressure great embarrassment of the respiration. In both of these operations the work was done in a practically bloodless field. In one of these cases, that of the pharyngeal tumor, there was some embarrassment of the respiration after the operation but no more than is often seen in narcoses, and the patient promptly rallied under artificial respiration.

Dr J. F. Baldwin, Columbus: I have had two unfortunate experiences, the cause of which has just been explained to me, much to my satisfaction. These experiences were in intubation, an operation which I performed very frequently until compelled to give it up within recent years. In the first case I had inserted the tube without special difficulty, and at the end of a week undertook its removal. As soon as it was removed the patient fell back apparently dead. I supposed the difficulty was in a plug of membrane obstructing the wind-pipe, and at once reintroduced the tube. In a few moments the child breathed and revived. A week later I again undertook the removal of the tube, but met with the same experience except that although the tube was immediately replaced as before, and artificial respiration practiced, recovery did not occur. On postmortem examination I expected to find a mass of false membrane, or else perhaps a flap of mucous membrane separated by ulceration produced by the end of the tube, but absolutely nothing was found to explain the death. In the second case I had introduced the tube without any difficulty, when the child ceased breathing and became pulseless. I instantly removed the tube, supposing I had pushed a mass of membrane before it, and practiced artificial respiration. There was no obstruction to entrance of air, but the child was dead.

These two cases had been puzzling to me and the explanation unsatisfactory until the presentation of the subject this afternoon.

Dr C. F. Clark, Columbus: In these cases of intubation, Dr Crile, if I understand you correctly, by the use of cocain you can in a large measure prevent this reflex inhibition?

Dr Crile. That is true. *Apropos* of Dr Baldwin's remarks. I would like to relate a case, which was told me by another physician. He and a fellow practician were making a laryngotomy, and they were very successful in their operation until suddenly the child collapsed. The parents had remained in another room while the operation proceeded. The doctors went to the door and told the relatives that the child was dead. The parents rushed in, feeling extremely shocked, but by the time they got over to the child it began to breathe again.

The technic of closing the vessels consists simply in picking up the arteries and the fascia, then by a little dissection you can very quickly adjust the clamps. You can very readily pick up the carotid arteries, separate the jugular veins and vagus nerves and apply the instrument. The instrument that I use is so made that the blades are horizontal. I put a small rubber tubing over the blades. A little set-screw, which you turn, approximates the blades with an absolute degree of accuracy. After the operation is over you can secure the vessels which you have clamped and you will see that they have not been injured in the least, and at the same time you have had absolute control of the field of operation on account of its being bloodless.

SOME UNUSUAL CASES OF SARCOMA OF THE KIDNEY, WITH A POINT IN DIFFERENTIAL DIAGNOSIS

J. F. BALDWIN, A. M., M. D., COLUMBUS

Case 1. Mrs B. E. H., aged 23; mother of two children, the youngest born November 28, 1891. She consulted me March 5, 1892, on account of a tumor which she had discovered in the lower abdomen. Examination revealed a tumor the size of a fetal head, freely movable, and evidently of rapid growth since nothing abnormal had been discovered by me at the time of her confinement, about three months before. The tumcr was solid and apparently originated in the left ovary. Operation was advised and was performed March 24, 1892. Her recovery from the opera-

tion was entirely uneventful. The tumor had a long pedicle, which was tied as far from the growth as possible, and had no adhesions except a very slight one to the omentum. This adhesion was ligated at a considerable distance from the tumor, so as to diminish the chance of recurrence, as the growth was evidently sarcomatous in character. This opinion was verified by subsequent section, and still later by microscopic examination, made by Dr James E. Reeves, of Chattanooga, Tenn.

In February, 1898, six years later, the patient commenced having severe pains in the back, which she supposed were those of lumbago. Ordinary remedies for this condition, both local and constitutional, failed to give any relief. April 23, 1898, I examined her and found a tumor which I decided involved the left kidney. From the fact that her ovarian disease had been sarcomatous, I assumed that the present growth was probably of the same nature, although of course nothing positive could be said as to its character. As it was somewhat movable I advised exploration with the idea of its removal. She refused however to consider this at all, and after a few weeks visited a sanatorium at Battle Creek, Michigan, where she remained some two weeks. Here she was told that the trouble was with her spleen and was inoperable. She returned home and I saw her again in July. She was now clamorous for some operation which would give her relief. I found the tumor quite firmly fixed and told her that I thought it was too late. I however made an exploratory incision July 16, 1898, cutting down directly upon the tumor. This examination enabled me to break up some adhesions which were interfering with the movements of the intestines, and also to satisfy myself that the tumor was, as I had already diagnosticated, sarcomatous. No attempt was made at its removal. She left the hospital a week after this exploration. The operation, while it had no effect upon the tumor, gave her quite complete relief from pain, so that she was almost entirely comfortable until per-

haps a week before her death, which occurred November 12, 1898. Autopsy was made by Dr Fraker in the presence of myself and two or three other physicians. It verified completely the previously made diagnosis.

Case 2. J. M. G.; aged 64 years; was seen in consultation with Dr D. N. Kinsman, August 14, 1895. He had noticed for several weeks the growth of a tumor in the right testicle. Examination led to the conclusion that this growth was probably malignant in character and its immediate removal was advised. He at once consented and I operated the next day. Examination verified the diagnosis of its malignancy, the form of disease being sarcoma. Recovery was uneventful.

March 19, 1896, I again saw him in consultation with his physician and now found his general condition very bad, the cause being evidently a large tumor which could be felt to the left of the median line, and which both Dr Kinsman and myself decided was of the left kidney and evidently sarcomatous. The patient was exceedingly fleshy and his general condition was so bad as to absolutely preclude any thought whatever of operation. He died a few days later, April 1, and the postmortem demonstrated the disease to be as we had expected, sarcoma of the kidney.

Case 3. F. J., aged 63 years. I was called to see the patient May 17, 1897, and found he had been losing flesh for some weeks and was visibly running down. His general appearance was suggestive of malignant disease. Examination showed a tumor of the left testicle and also of the left kidney. My conclusion was very positive that the tumor of the testicle was sarcomatous and that therefore the growth in the kidney was almost certainly of the same character. I gave an unfavorable prognosis, and, as he was a man of wealth, advised him to set his house in order for the end which could not, in my judgment, be many months distant.

I telephoned his attorney the next day to the same effect. A few weeks later, by the advice of his attending physician, he went to New York and there consulted one of the most widely known surgeons of that city. He was sent to a hospital that his case might receive careful attention. The diagnosis was finally reached that he had an enlargement of the spleen, probably malarial in character, and he returned home with that diagnosis and favorable prognosis. His health continued to fail and he died October 27, 1897. The autopsy, which was made by Dr Dickson L. Moore, revealed sarcoma of both kidney and testicle.

Case 4. R. J. D., was seen in consultation with Dr Kahn, October 31, 1898. The conditions present were very similar to those in the case previously given. From the family history however there was a little question as to the diagnosis, as we felt that the trouble might be tubercular. As the testicle was the source of a great deal of pain its removal was advised simply for temporary relief. The operation was made two days later, and the disease found to be sarcomatous, as anticipated. The tumor of the kidney is still growing, the patient is very weak and evidently cannot live long, as his physician reports to me, and there seems to be no doubt as to the disease here being identical with that in the testicle. (Death occurred during the week following the reading of this paper. Necropsy showed sarcoma of the kidney.)

I have here reported three cases of sarcoma of the testicle developing either previously to or simultaneously with sarcoma of the kidney; in one case the kidney on the opposite side being involved. I have also reported one case of sarcoma of the ovary preceding the same character of growth in the kidney, with an interval between the two of six years.

While sarcoma of the kidney alone is by no means rare,

cases in which there is antecedent or coexistent sarcoma in the testicle or ovary are so rare as to merit report.

My own opinion is that in all the cases which I have reported the disease of the kidney had no direct connection whatever with that in the other organ. It was simply an independent manifestation of the disease.

Most, in *Virchow's Archives (Jour. A. M. A.*, March 11, '99), from a study of six cases of malignant disease of the testes, has shown that recurrence took place in the retroperitoneal lymph-glands, these being the first and principal glands affected. In these cases the original tumors were mostly sarcomatous and were distinguished by a peculiar malignity. "He adds, as the result of further research on cadavers, that the testes are abundantly supplied with lymph-vessels. They leave the gland with the *funiculus spermaticus* and pass through the inguinal canal in four to six large stems, behind the peritoneum to the level of the lower pole of the kidney, then turn toward the median line and debouch in the first glands. They do not branch at any place. The first glands, two to four in number, are located near the aorta on the left; on the right they all lie without exception directly over the *vena cava*. Back of the larger abdominal organs a network of vessels with glands extends from their bifurcating point upward to the neighborhood of the *cysterna chyli*. These glands can be injected from the testes. The lymph flows from these regions through branches which pass upward behind the large abdominal and renal vessels and debouch in the *cysterna chyli*. The metastases of tumors of the testes correspond to this course of the lymph-vessels."

In the case which I have reported there was no evidence of any involvement of these retroperitoneal glands, and this is further evidence that the involvement of the kidneys could not have been metastatic in character.

As we all know, in embryologic development the ovaries and testicles are derived from the same tissue, and this

tissue comes from practically the same point as that which goes to the development of the kidneys. It is therefore not a violent assumption that malignant disease might appear in both places independently. In the case of the woman it is, I think, very evident that the sarcoma which appeared in the kidney six years after the removal of the sarcoma of the ovary, could have had no metastatic connection whatever with the one which first appeared.

In connection with these cases, and with cases of tumor of the kidney in general, I wish to bring out one point in diagnosis which I have found very frequently overlooked by excellent physicians. In two of the cases here reported, very eminent surgeons made the diagnosis of enlargement of the spleen. A similar diagnosis I have seen made in several other cases by equally skillful, if not equally prominent, medical men.

A moment's consideration will satisfy anyone that owing to the anatomic relationship between the kidney, when in its proper place, and the descending mesocolon, the enlarging kidney tends to separate the folds of the mesocolon so that the colon itself comes to lie directly over the most prominent part of the growth, or on its outer side. Under ordinary circumstances colonic tympany can be demonstrated in all these cases, but in case of doubt it is a simple matter to distend the colon by injecting air, so as to demonstrate positively the position of that bowel.

It is also equally evident that the spleen as it enlarges from disease must, for anatomic reasons, inevitably form a tumor upon the outer side of the colon, so that colonic tympany must be manifest toward the median line from the tumor. By no possibility can the colon be in front of, or on the outside of, the enlarging spleen. If then colonic tympany can be demonstrated in such a position, splenic tumor can be absolutely excluded.

DISCUSSION

Dr W. J. Means, Columbus: The point the doctor has made relative to a differential diagnosis in sarcoma of the kidney, is certainly a very important one and should be borne in mind by every physician when examining tumors in this region. Since there is no cure for sarcoma of the kidney either medicinally or by operation, the main interest lies in the diagnosis. The doctor referred to a previous history in two of his cases of sarcoma of the testicle, but did not make it clear as to the relation of the subsequent condition of the kidney. It is a well-known clinical fact that sarcoma is carried through the blood-vessels, and carcinoma through the lymphatic vessels. Owing to there being no direct or even indirect connection through the veins between the testicle and the kidney we would anticipate a metastasis. The lymphatics of the testicle do not communicate with those of the kidney, therefore we would not expect metastasis even in carcinoma. I believe there are no satisfactory statistics establishing metastasis from the testicle to the kidney in malignant diseases.

Dr C. A. Hamann, Cleveland: I am very much interested in the doctor's cases. The doctor, I believe, referred to some affection of the retroperitoneal lymph-glands. I have seen two cases of sarcoma of the retrocolic glands, and such neoplasms produce practically the same symptoms clinically as sarcoma of the kidney and the diagnosis would be very difficult to make. Furthermore I have seen these cases of primary retrocolic sarcoma mistaken for neoplasm of the kidney. Now as regards the metastasis, one cannot anatomically explain metastasis from the testicle to the kidney, except possibly on the left side. Even then the sarcomatous cells would have to be carried in the opposite direction to the flow of blood. There is no lymphatic connection at all.

Dr J. F. Baldwin, Columbus: The point which I wished to make in diagnosis was not between other tumors, such as retrocolic tumors and kidney tumors, but between tumors of the kidney and the spleen, because the mistakes which were made in all these cases to which I have referred were of that character. An enlarged spleen should be positively eliminated by finding it on the outside of the descending

colon. Of course I am aware that the relative location of the colon would not be necessarily a means of diagnosis between enlarged spleen and some other tumors.

In regard to the extension of sarcoma, it extends in both ways, both by the blood and the lymph. I think there is no doubt about that. The paper from which I quoted said the same thing. Certainly there is no blood connection possible between the testicle or ovary and the kidney, and for that reason extension to the kidney could be eliminated in all the cases which I have reported. It was for this reason that I took the ground that the disease in the kidney in all these cases was practically primary in character; that is, that there was no metastatic connection between the disease here and that in the other organs. In two of the cases, you will remember, when I first saw them the disease was manifested in both testicle and kidney, and from the history it probably commenced about the same time in both. In one of the other cases the patient weighed nearly 300 pounds and it would have been impossible to detect the kidney tumor until it had become quite large, but the fact that the man's health had been poor for some time would seem to indicate that the disease was in existence at the time we removed the testicle. That it occurred in the kidney on the opposite side is further argument against metastasis.

I have reported these four cases simply because of the extreme rarity of cases in which simultaneous with, or subsequent to, development of sarcoma of the testicle or ovary there is a similar involvement of the kidney.

THE USE OF ROENTGEN RAYS IN SURGERY

WILLIAM JORDAN TAYLOR, B. S., CINCINNATI

Gentlemen of The Ohio State Medical Society:

Being honored with the opportunity of speaking to you on the practical application of the X-Ray in surgery, it gives me pleasure to present to you such portions of the subject as I am able in the time at my disposal.

The skepticism which existed as to the practical value of the Roentgen-ray in surgery and medicine has been largely dissipated by experience. The great improvement

in apparatus, by which the length of exposure in the making of skiagraphs has been reduced from minutes and hours to a question of seconds, has vastly extended its usefulness. These short exposures are of twofold advantage. The probability of movement, with consequent blurring of the image, is lessened and the injurious effects are to a large extent obviated. While the Roentgen-ray is of undoubted value in anatomic and physiologic investigation I shall limit our consideration to its use in surgery. Dr Arthur L. Fisk, of New York, says:[1] "The rôle of the X-Ray in surgery is similar to that of the ophthalmoscope, the laryngoscope and the cystoscope."

As the bones are the most opaque of all tissues we find the X-Rays especially useful in the study of their condition, and of the joints, hence in questions of diagnosis of diseases and injuries of these structures they are of the very greatest value.

An important application is in the study of congenital deformities, as in this case of supernumerary digits, where the character of operation would be determined by the existence or nonexistence of the metacarpal and metatarsal bones corresponding to the extra phalanges.

In acquired deformities the conditions can be exactly determined *e. g.*, in one case following dislocation of the elbow repeated efforts to retain the parts in proper position having failed, it was found on examination that the olecranon had been destroyed. As W. W. Keen has recently said,[2] "In cases of knock-knee the relative size of the two condyles of the femur, and whether the trouble is located in the femur or in the tibia can be determined." Lateral curvature of the spine can be demonstrated.

Its utility is shown in diseases of bone. In a case submitted to me by Dr James T. Whittaker osteomalacia was

[1] Trans. N. Y. State Medical Society, 1898.
[2] Cyclopedia of the Diseases of Children, Vol. V. p. 398. Keating.

No. 56 SUPERNUMERARY DIGITS

made evident. Mr Noble Smith[3] has called our attention to the value of skiagraphs in suspected caries of the spine. All destructive lesions of bone can be demonstrated.

The most important field of application is in the determinations of injuries of the bones and joints, the differentiation of fractures in the vicinity of joints and dislocations, the existence or nonexistence of fractures, and the proper adjustment of injured parts, in cases in which the parts are so greatly swollen that all ordinary methods of examination are inapplicable.

As the usual splints and dressings do not interfere with the transmission of the rays, after the dressings have been applied we can determine with absolute certainty the results of our efforts at adjustment.

In my experience the most frequent demand is for the location of foreign substances in the body. Not only does it determine their presence and location but the skiagraph is the best guide for operation. In the case of a boy shot in the head five years previously, the exact location of the bullet was determined but it was deemed unwise to attempt its removal. Foreign bodies in the eyeball, in the trachea, in the esophagus can frequently be discovered and located. Bodies that have been swallowed can be located, if lodged, or their passage through the body can be marked. It is sometimes equally important to disprove the presence of foreign bodies.

A very important use is in the detection of the various forms of calculi. Dr Leonard of Philadelphia, says:[4] "The advantages of the Roentgen-ray method of diagnosis in cases of renal calculus, as demonstrated by clinical experience, are: Its absolute accuracy, positiveness and comprehensiveness; its freedom from pain, shock and danger; and, in addition, all the advantages that accrue from an early

[3] *British Medical Journal*, 1896. Vol. I, p. 1382.

[4] *Philadelphia Medical Journal*. April 22, 1899.

absolute diagnosis. Completeness of operation is assured by the detail which it gives, while the operation is facilitated in its execution. The negative diagnosis will frequently render operative interference unnecessary and save the patient the risk and annoyance of an exploratory operation. The positive knowledge it gives regarding the presence of calculi in one or both kidneys makes operation upon the wrong kidney impossible and gives warning of the danger when both kidneys are involved. Its value is therefore evident in all classes of cases—when there is but a suspicion—it saves the patient from the menace of anuria; when the calculi are known to be present it gives their absolute location and number; and when no calculi are present it saves the patient the risks of an exploratory nephrotomy. It consequently has indications for all classes of cases and offers a solution for the diagnostic difficulties surrounding calculous nephritis. The diagnosis it affords is absolute, both positively and negatively, and has the advantages of mathematic accuracy."

The new applications which promise to be of great utility are in the diagnosis of pulmonary and cardiac lesions; and my observations lead me to concur with others in the opinion that the Roentgen-ray is of decided therapeutic value.

SKIAGRAPHS EXHIBITED

Supernumerary digits; osteotomy for knock-knee; lateral curvature of spine; osteoma; osteosarcoma; tubercular elbow-joint; tubercular knee-joint; mashed toe; unadjusted fracture of tibia and fibula; ununited fracture of fibula, 14 months duration; dislocation of the head of the radius; ununited fracture of tibia with bending of fibula; dislocation of astragalus with fracture of calcis; dislocation of humerus and radioulnar articulation; fracture of humerus, lower third; fracture of humerus anatomic neck; backward dislocation of astragulus, with fracture of tibia; dislocation of astragulus; fracture of tibia; Pott's fracture; bullet in

NO. 34 BACKWARD DISLOCATION OF ASTRAGULUS WITH UNDETECTED FRACTURE OF TIBIA
6 MONTHS DURATION

brain; bullet in shoulder; bullet in femur; bullet in muscles of back; needle in thigh; needle in hand; needle in hand; needle in foot; needle in arm.

DISCUSSION

Question (by ?): I understood the gentleman to say that the Roentgen-ray was of decided therapeutic value. I would like to know if we understood him aright?

Dr W. J. Means, Columbus: There is a matter I noticed recently in a Chicago paper that interests X-ray operators. A patient got a judgment of $10,000 for injuries supposed to have followed the use of the X-ray. I would like to ask the gentlemen if he has noticed any deleterious effects from its use. The suggestion that the X-ray has a decided therapeutic value would lead us to believe that the converse might be true.

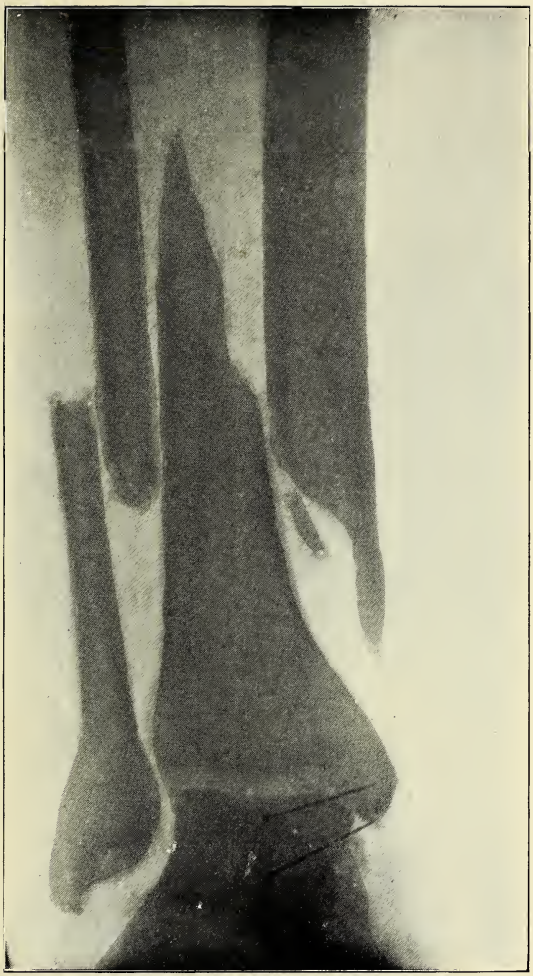
Dr Hall: I wish to compliment the essayist upon his able effort and especially upon the pictures. I have had some little experience in dealing with the rays, and I have found their therapeutic value, as Mr Taylor has said, to be of the greatest benefit. I do not wish however to answer the question in regard to the therapeutic value, but will let the author answer. I had an opportnuity to use skiagraphic pictures in connection with a case of fracture of the upper third of the femur. I was very fortunate to find out what I did at the time, what would have been very damaging to a young practician, that the fracture at that time was not properly set and had slipped. I would also ask Mr Taylor if he has had occasion, in his large experience with the skiagraph, to find any effect whatsoever that would be anything other than beneficial to the patient.

Dr J. F. Baldwin, Columbus: I think we are under many obligations to Mr Taylor for presenting to us such an excellent series of photographs. I think it is quite important that the man who does X-ray work should be an expert, otherwise the information given may be very misleading. I remember a case I sent to Dr Early, our X-ray photographer in Columbus, some time ago. It was a case in which a woman had been shot by her husband, the bullet entering the head near the external ear. As the result of

the examination the doctor was very positive that the bullet was outside of the jaw. I told him I could not see how it could possibly be there from the direction of the bullet and the condition of the parts, but he was absolutely certain he had not misinterpreted the negative which he had obtained. I made an incision and removed the bullet, but I found it at a finger's length inside the jaw-bone, and therefore nowhere near its supposed place of lodgment. Dr Early has shown me photographs so taken as to show apparently a very marked deformity in a natural limb. And on the other hand, what seemed to be a normal limb was shown when in fact it was considerably deformed. There is a good deal of trickery possible in these photographs, and I think the physician should accompany his case always in going to the radiographer and should use the fluoroscope himself, so as to know exactly the way in which the picture is being taken.

A year ago a patient came to me from Virginia, who had had a knife-blade broken off in his lung and who seemed to be going into consumption. With X-ray photographs, taken in different directions, I was able to locate the knife-blade, which was about a finger's length inside the ribs. Its removal was accomplished without great difficulty after removing a section of rib, and recovery was prompt. Recently I have seen a table devised with cross-lines so that by taking two exposures it is possible to locate a foreign body very satisfactorily in the exposed limb or trunk. It seems to me that there is a wonderful future, a wonderful present though for that matter, in the diagnostic use of the X-rays. I must confess however that I am a doubting Thomas as to their having any value therapeutically. I would like to hear from Mr. Taylor on this point, not as to any accidental improvement, but as to any actual therapeutic benefit which he has seen derived from the use of these X-rays.

Dr F. C. Larimore, Mt. Vernon: The X-ray has been a revelation to me this week.. Last year a young girl, 26 years of age, was caught under a switched box-car and came out with an amputation of the right thumb, and amputation of the right index finger, a fracture of the middle finger, a dislocation of the right ankle-joint, and a fracture of the spine. The only evidence of a fracture in the spine was a distortion of one of the spinous processes to the left. There was retention of the urine for a while, but there was no



No. 11 UNADJUSTED FRACTURE TIBIA AND FIBULA
6 WEEKS DURATION

paralysis in any part of the body indicating serious injury of the spine. After a month or so, during which she was in bed, I did not see her for a period of three or four months. Then I noticed a marked distortion of the spine, which had been going on in the meantime. I called the attention of the other surgeons to this matter, but they did not seem to pay much attention to it. She complained of her back, but was getting around then. She had a brace put on. Recently an X-ray picture was taken. I was a doubting Thomas in the matter and doubted very much whether it could show up the spinal column to any advantage. Dr J. H. Nichols of Mansfield, took the photograph and it is a revelation to me and a surprise. Some of the gentlemen have spoken of an opthalmoscope. I would just as soon try to make a diagnosis of internal diseases of the eye without the ophthalmoscope as of diseases of the bones without the X-ray. The picture showed the outline of the bodies of the vertebras, it showed the ribs on either side of the shadow, and opposite the twelfth vertebra we found the space. Now can the X-ray man—I suppose he could—in his photograph, which is done largely with the brush, fake that? He could I suppose deceive us in the photograph, but can he in the negative? The negative in that case indicates a complete crushed body of the twelfth dorsal vertebra. This is the way it looks in the picture. But if he can develop a negative representing a fracture that does not exist then I may be deceived and I should be careful not to make a flowery diagnosis with the X-ray especially if there should be danger of being led into that sort of a snap. This photograph was taken at the instance of her lawyers and now defendant has petitioned the court to have her compelled to have another X-ray picture taken. This petition was not sustained. Dr N. S. Scott has told me that you could not depend upon any one or two negatives, depending largely upon the position of the man who takes the X-ray pictures. The patient in this case objects on the ground that it hurt her before. It was fifteen minutes' exposure and did not burn her nor do anything that way. But I would like to know to what extent we can depend on the X-rays. There has been no paralysis. Now a year has passed. It has certainly increased my interest in the X-ray. The treatment in this case was purely expectant. She was not put in any plaster-of-Paris dressing nor anything of that kind.

Mr Wm. J. Taylor, closing: As to the therapeutic effect of the X-ray, I will cite one case that came under my observation. A man was submitted to me, with an enormously distended knee. There was the diagnosis of tuberculosis of the knee-joint. The first X-ray photograph taken was not satisfactory. The man was a conductor on the Big Four Railroad and not able to continue his work. In a few days he submitted to another exposure, but it was not satisfactory. I made five exposures with no satisfactory results. After the third exposure the man claimed to be regaining the use of his limb, the swelling was going down, and upon the fourth exposure the improvement was still more marked. After the fifth exposure the doctor said we would not amputate now, but wait a while. The man is now in active service on the Big Four and in every way has a perfectly healthy knee. I myself have not had experience with it in lupus, but a number of writers say that it is positive in its cure of lupus. As to injurious effects, in my own experience there have not been any. I have made as long as three hours' exposure with the old machine without any trouble. But the new machines do not require such long exposure, eight minutes being about the longest time required. So with the new machine bad results are not probable. Dermatitis may occur. As to the case in Chicago. A person submitting to X-ray photography occupies very much the same relation to the operator that the man who takes ether does to the anesthetizer. I try to have the people understand that when they come to me, and that I am not to be responsible for accidents. As to the exact location of foreign bodies, two photographs are necessary, and several photographs are advisable, taken from different angles, *e. g.*, in the case of a woman who ran a needle in her foot while dancing and suddenly experienced severe pain which continued for several weeks until she came to me on the advice of her physician. The photograph from above downward showed the needle, but without the photograph in profile we would not be able to tell where it was. Those who have had much experience with the making of photographs can bring about almost any result. The doctor should be present and should be able to see exactly how the pictures are taken, and that will enable him to form a more accurate opinion.

Question: Is it possible to touch up the negatives, so that it does not show in the negative that it is paint, or will that show in the negative?

Mr Taylor: It will show in the negative. The print can be "doctored up," but the negative cannot be doctored without you being able to detect it.

Question: Can the plate be retreated to remove the paint patches?

Mr Taylor: You can make a negative from the negative, but the original negative cannot be doctored without you being able to detect it.

CASES OF OBSTIPATION RADICALLY TREATED

THOS. CHAS. MARTIN, M. D., CLEVELAND

Teacher of Proctology in the Cleveland College of Physicians and Surgeons; Proctologist to the Cleveland General Hospital, etc.

Proctoscopy [1, 2, 3, 4] having served as a means to newer ideas of the anatomy of the rectum [5, 6] a new research into the mechanics of defecation was necessitated. [7, 8, 9] Therefore the role of the rectal valve has been determined and it is now incumbent upon us to rewrite the definitions of obstipation and constipation.

[1] Proctocolonoscopy and Its Possibilities: by a New Method. Thos. Chas. Martin, M. D., *Mathews' Quarterly Journal of Rectal and Gastro-Intestinal Diseases.* July, 1896.

[2] "A New Simplest Proctoscopy." Thos. Chas. Martin, M. D. *Journal of the American Medical Association.* August 27, 1898.

[3] "Complete Inspection of the Rectum by Means of Newer Mechanical Contrivances." Thos. Chas. Martin, M. D. *American Gynaecological and Obstetrical Journal.* December, 1898.

[4] "Chronology of the Methods of Atmospheric Inflation for Inspection of the Rectum and Sigmoid Flexure." Thos. Chas. Martin, M. D. *Virginia Medical Semi-Monthly.* March 24, 1899.

[5] "New Evidence that the Rectal Valve is an Anatomical Fact." Thos. Chas. Martin, M. D. *Mathews' Quarterly Journal of Rectal and Gastro-Intestinal Diseases.* October, 1896.

[6] "The Surgical Importance of a Recognition of the Topographic Anatomy of the Rectum." Thos. Chas. Martin, M. D. *The Columbus Medical Journal.* May 17, 1898.

[7] "The Act of Defecation." Thos. Chas. Martin, M. D. Transactions of the American Proctologic Society, 1899.

[8] "Difficult Defecation in Infants." Thos. Chas. Martin, M. D. *Journal of the American Medical Association.* February 19, 1898.

[9] "A Further Contribution to the Study of the Difficulties of Defecation in Infants." Thos. Chas. Martin, M. D. *Journal of the American Medical Association.* November 5, 1898

Obstipation may be defined as that condition of obstructed defecation which is due to the presence in the rectum of an organic obstacle to the descent of the feces through it; on the other hand constipation may be defined as that condition of delayed defecation which is due to a prolonged residence of the intestinal contents in the higher portions of the gut and which may be the result of a great variety of causes which affect the intestinal, gastric, and other secretions, which affect the innervation of the bowels, which may be due to errors in diet or to a great variety of accidental or diseased conditions. Both obstipation and constipation therefore may be present in one individual at the same time.

Obstipation is a local disease and demands local treatment for its relief.

It is not my purpose to consume our present time with descriptions of the rectal valve and the methods by which I have conclusively demonstrated its existence as an integral rectal organ; nor is it my intent to describe here, even in brief, my researches into the actions of the rectal valve during defecation; nor shall I include in this short paper detailed descriptions of the operations by means of which the subject of obstipation may be relieved; these studies have been reported by me elsewhere.[10, 11] The purpose of this paper is to present cases which prove the beneficence of protoscopy, valve-divulsion and section. We are no longer justified in compromising with the obstipated.

Case 1: June 3, 1898, an unmarried woman 32 years of age consulted me for the relief of long-continued obstipation. She reported that for many years defecation was possible and easy only when the feces were rendered fluid by means of cathartitcs or enemata, that when the feces

[10] "Is the Use of the Rectal Sound Scientific?" Thos. Chas. Martin, M. D. *American Gynaecological and Obstetrical Journal.* August, 1898.

[11] "Phantom, Semilunar and Annular Stricture of the Rectum." Thos. Chas. Martin, M. D. Transactions of the American Medical Association, 1899.

were formed their evacuation was accomplished only with the greatest of straining and by manual assistance. The young woman was profoundly neurasthenic and suffered from repeated attacks of intestinal autointoxication. Proctoscopy discovered a general hypertrophic proctitis and such a degree of hypertrophy of the rectal valves and contraction of the valve-straits as is equivalent to multiple annular stricture. Without the employment of general anesthesia the fibrous bands beneath the valve-margins were divided by means of a knife especially designed for the purpose. The operation was painless and unaccompanied by hemorrhage. Within three days the patient was able to take a journey of several miles to visit me at my office. During the first two or three days without the aid of enemas or cathartics there was on each day a normal evacuation. On the third day fearing that there would be contraction of the valve at the seat of the wound I practiced instrumental massage. There ensued a mild degree of diffused proctitis and for some weeks the defecation was attended with some difficulty but in much less degree than formerly. The proctitis subsided. Normal defecation was restored.

Case 2: A man aged 24 years was referred to me by Dr H. L. Spence in August, 1898. The patient presented a history of persistent obstipation which began after an attack of fever from which he suffered some six years ago. The patient reported that except when the feces were rendered fluid by means of cathartics or enemas it was impossible for him to procure evacuation of the bowels. He reported that there had been progressively increasing difficulty in getting injected fluids into the colon. He complained of tenderness and pain throughout the region of the sigmoid and reported that for several years rectal irrigations had brought cord-like and membranous deposits on their return. The patient was neurasthenic. Proctoscopy discovered a general hypertrophic proctitis with no

apparent contraction of the valve-straits, and hypertrophy of the rectal valves, their borders being twice their normal thickness, which, on the employment of the hook, were discovered to be rigid and inelastic. The sigmoid was observed to be enormously dilated and here and there were observable deposits of gelatinous mucus. Without the employment of artificial anesthesia the fibrous band beneath each valve-border was painlessly divided. Subsequently the valves were subjected to instrumental massage by means of the coactor, the rectosigmoidal mucosa was sprayed daily with a weak solution of nitrate of silver. At the end of ten days defecation was being daily normally performed and the pain and tenderness had entirly subsided in the sigmoid.

Case 3: In October 1898, a married woman 34 years of age, the mother of two children, consulted me for relief of persistent obstipation and annoying borborygmus. She was emaciated, neurotic and irascible to the last degree. She reported that since childhood she had been the subject of difficult defecation, the rectum was evacuated only occasionally, and, within the last few years, she had suffered recurrent attacks of diarrhea. Proctoscopy discovered the two lowermost rectal valves slightly hypertrophied and the presence of two much-hypertrophied valves at the juncture of the rectum and sigmoid flexure. The sigmoid was observed to be much dilated and superficially eroded in various places. Because of her nervous symptoms and of her inability to properly control herself she was placed in a condition of general anesthesia and all the valves divided. During the next four weeks without the employment of cathartics or enemas defecation was normally performed at irregular intervals. At the end of four weeks, because the patient would not submit to instrumental massage of the valves, which I deemed necessary to prevent their contraction and to make a perfect cure, the woman discontinued her relation to me as a patient. Some two months

subsequently, however, she called at my office and reported that during the preceding six weeks defecation had been performed daily without difficulty and without the employment of artificial aid; also she has almost entirely recovered from neurasthenia.

Case 4: In June, 1898, a married woman aged 36 years, the mother of three children, was referred to me by Dr G. W. Crile for the relief of obstipation and continued pain in the iliac fossas. She reported that from childhood she had never had an evacuation of the bowels except when the feces were fluid and had been rendered so by cathartics. She was addicted to the physic habit, was neurasthenic, suffered repeated attacks of intestinal autointoxication and recurrent attacks of proctosigmoiditis. Proctoscopy discovered hypertrophic proctitis of such a degree as to interfere with spontaneous ballooning of the rectum. Several applications of instrumental massage, divulsion of the rectum by means of the coactor, and spraying the rectum with nitrate of silver solutions soon rendered rectal inflation possible and permitted the discovery of four hypertrophied rectal valves. An operation for the division of the valves was attempted without the employment of general anesthesia, but because of the nervous movements of the patient it was found necessary to completely anesthetize her for the sake of continuing the focus of light upon the field of operation. Without the aid of enemas or cathartics normal defecation was almost immediately instituted and firmly-formed feces were evacuated with little or no straining once in two or three days and finally daily with only an occasional intermission. However, the patient was many months recovering from the intestinal autointoxication incident to the dilated sigmoid.

I have operated upon 38 patients whose cure has been established for sufficient time to justify report. A few have been relieved by means of instrumental massage of the valve and without resort to its section. The four cases

presented represent the average in severity of disease and in the results achieved. The complications of the hypertrophied valve, which may be dilated sigmoid and colitis in varying degree, may contribute to the establishment of *con*stipation. In such a case in addition to local treatment by application of sprayed solutions, lavage and massage, such measures as will improve the general condition of the patient must be employed.

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TREATMENT OF FRACTURES OF THE PATELLA

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My experience with fractured patellas has been limited to six cases, all of which, except one, were treated by the operative method. Four of them were treated by open arthrotomy; one by Barker's subcutaneous suture.

I shall not attempt an exhaustive study of the comparative advantages of the various methods of treatment advocated by different writers. The literature covers a wide field, and much of it, like that on other surgical subjects, has become antiquated as modern ideas and methods prevail. To illustrate: Wyeth, in his work on surgery, edition of 1887, says: "Many innovations have been made in the treatment of these fractures, some of which are unnecessary and unjustifiable." Aspiration is mentioned as one of the unnecessary innovations. He says: "The most unjustifiable method of treatment ever introduced in this fracture is that of opening the joint and wiring the fragments together." It is only the more recent literature that is worth reading, and, I am sorry to say, there is much in this that will not bear

the test of modern scientific observation. The text-books cling to some of these antiquated ideas so tenaciously that the reader may be misled as to their real worth. Recognizing the possible dangers in open arthrotomy, authors of text-books hesitate to give preference to this method of treatment. In the hands of those who are not competent, or those who have not the advantages of skilled assistants and aseptic surroundings, there is perhaps a great deal of danger to life and also of permanent injury to the joint. While this conservative position is a commendable feature it is strange that such instruments of torture as the Malgaigne hooks are given prominent notice.

The treatment naturally divides itself into the nonoperative and the operative. Long experience has shown that fairly good results can be had from the nonoperative treatment. It again shows that bony union of the fragments is not obtainable, that fibrous union is not permanent and that the functional activity of the patella is limited. Some authorities claim that the failures are due to faulty methods; but when we consider that the methods are almost as numerous as the writers, it is doubtful whether this assertion is literally true.

In the first place it is practically impossible to get apposition of the fragments and maintain it. The great extensor-muscle of the leg, that holds the upper fragment firm in its grip, is hard to extend and to immobilize. Again the space between the fragments is filled with effused blood, synovia, and loose tissues. When the joint is opened and the nature and extent of the debris filling up the space are seen, the surgeon can comprehend the difficulties in the way of apposition. The upper fragment often carries with it shreds of the aponeurotic tissues that drop into the space and cannot be removed other than by mechanical means. In comminuted fractures the difficulties are much greater, and, I might say, insurmountable.

Another difficulty arises in fixing the fragments. The

upper one especially lies loosely beneath the integument and cannot be held fast with any appliance over the integument, without using a pressure that is not safe to the tissues.

In one case of ancient fracture coming under my notice, and reported in this paper, the effused blood had become organized, and the joint very much hypertrophied therefrom. The lacerated capsule may also become attached to the surrounding fascia in such a manner as to destroy the normal function of the joint.

Again the nonoperative treatment is productive of a great deal of physical inconvenience, owing to the fact that the appliances to hold the fragments in apposition must of necessity produce considerable pressure, thus causing pain. The duration of the treatment is another inconvenience that must not be overlooked.

It is suggested by some authors that the effused blood be removed by aspiration, but when this is resorted to the danger of infection is almost as great as in open arthrotomy.

In justice to the advocacy of the nonoperative treatment it must be said that the knee-joint is more prone to infection than the abdominal cavity; and it is only by the most strict aseptic technic that infection can be avoided.

Whatever form of splint is used, the fact must be taken into consideration that the disability is largely due to the contraction of the quadriceps muscle, and that this contraction must be overcome. The contraction of the *ligamentum patellae* is limited. A splint made out of strawboard is perhaps the simplest of construction and application, and yet as efficient as any that can be applied. A piece of strawboard long enough to reach from the gluteal fold to the foot, and in width equal to one-half the diameter of the leg, is moistened on one side, and molded into a trough. Sufficient nonabsorbent cotton to protect the integument from chafing should be used. At the joint a heavier pad should be made to relieve the leg from over-extension, a very painful position. Before placing the splint an elastic bandage should be

applied over the joint. This will in two or three days reduce the swelling and place the joint in condition for the application of fixation-straps. These can be applied in various ways. The best however in my judgment is the rubber adhesive plaster; the upper piece cut in the shape of a U, and the lower one in the shape of a T. These pieces are applied with their expanded margins at the upper and lower borders of the respective fragments. A snug bandage should be applied to hold them in place. The fragments are then approximated, and the ends of the adhesive straps fastened; these again should be held in place by bandages applied in such manner as to assist in holding the fragments together. The posterior splint should then be placed and a firm bandage applied from the toes to the groin. I have found strawboard to be economic and efficient for almost all kinds of splints.

There are other methods of treatment that perhaps deserve mention, but I have had no experience with them, and therefore do not care to discuss their particular merits. I might mention however, inasmuch as the method should be used more or less in all cases, that the treatment by massage is now being advocated by some well-known surgeons. It is called the Dutch method, and was introduced by Titanus of Amsterdam, in 1885. This method removes the objection of long confinement, and its advocates claim excellent results. However there is no evidence presented that bony union takes place in cases thus treated. It claims that the function of the knee is more perfect than by any other nonoperative method. For a description of this method I will refer the reader to an article by Charles A. Powers of Denver, Col., published in the "Transactions of the American Surgical Association." It might not be out of place to say that this article is perhaps the most exhaustive one on the subject of fractures of the patella that I have found in medical literature.

My limited experience with the operative treatment has yielded such excellent results that I am ready to place myself on record as favoring it. I have seen a few cases treated by the open method that went wrong; but I was satisfied that the technic of the surgeon was faulty.

The technic of the operation is of great importance. It seems to me however, that the one consideration that is paramount to all others is that of asepis. I shall not enter into any detail as to the preparation of the field of operation; this is well known to every surgeon. The incision opening the joint is perhaps a matter of choice. I have used the transverse incision and the longitudinal, and the results were practically the same. However my choice is the longitudinal incision; I believe it to be the more scientific. The incision should be made of sufficient length so that when the edges are retracted the fragments may be fully exposed. This may require an incision four or five inches long; the length has no bearing upon the result. When the fragments are exposed the clotted blood should be thoroughly cleaned out, the shreds of lacerated tissue trimmed off, and the hemorrhage controlled by pressure with gauze sponges wrung out of hot water (no other material should be used for this purpose). Continuous irrigation with a hot saline solution should be used. Whether this acts as a preventive to infection I am not prepared to state. It is my practice to make all arthrotomies under continuous irrigation of a salt-solution. The uniform success obtained has led me to look upon it as an important part of the technic. After the lacerated aponeurosis and all loose tissues have been neatly trimmed, the fragments are drilled in three places. Three sutures properly placed are sufficient to hold the fragments in apposition. The drill should be started a quarter of an inch back of the margin and come out anterior to the posterior surface of the patella. The suture material should be absorbable, therefore kangaroo-tendon or catgut is used. The one difficulty that I have experienced with kangaroo-

tendon is its tendency to break in tying the knot. Silver wire should never be used. I have used it in many cases of fractured bones and have always had more or less trouble with it. After the sutures have been placed in position, the fragments are brought together and the sutures tied. Great care should be observed that the joint is free from oozing. The aponeurotic tissues are then sutured with No. 1 catgut. I regard this as an important step. The sutured tissues add much firmness to the fractured patella. If left alone, adhesions form and the gap between the surfaces fills in with fibrous tissue, which materially effects the normal function of the joint.

The following is the report of the cases that I have treated:

Case 1. Mr S., age 50, dissipated. Slipped and fell on the sidewalk. I saw the patient within two hours after the fall. Examination showed a transverse fracture of the patella of the right knee. There was no contusion of the skin. The fracture was evidently caused by the contraction of the quadriceps muscle. The fragments were separated about 1½ inches. The knee was badly swollen. The joint was aspirated and about eight ounces of blood removed. A subcutaneous suture of silkworm-gut was passed around the fragments according to Barker's method. The fragments were brought together and the ends of the suture tied externally. An elastic bandage was applied over the joint and a posterior splint of strawboard adjusted. After 48 hours the elastic bandage was removed. There was very little swelling. The fragments were practically in apposition. The suture was reinforced by adhesive-plaster straps over the integument, and a plaster-of-paris splint was applied. The splint was removed in three weeks and the suture taken out. A posterior splint was applied for several weeks afterward. The patient became insane and was taken to the State Hospital. I am unable to give the result.

Case 2. Mr T., age 28, good habits. Fell from a ladder and struck on his left knee, producing a compound, comminuted fracture of the patella. Patient was taken home and treated there. The wound was carefully cleaned with tincture of green soap and boiled water. The edges of the lacerated tissues were carefully trimmed. All loose shreds of whatever kind were removed. The fragments were brought together with kangaroo-tendon; five sutures in all were used. The field of operation was continuously irrigated with a hot salt-solution during the manipulation. The edges of the lacerated capsule were united with fine catgut sutures. The integument was united with silk. No drainage was used. The joint was immobilized with a posterior perforated zinc splint. The joint was kept moist for several days with a solution of boric acid, alcohol and glycerin. On the seventh day the sutures were removed, and a dry dressing applied. The leg was then immobilized and was not touched for three weeks. The splint was taken off and passive motion made. In three months the patient was using his leg and able to flex it to an angle of 45 degrees. It was quite a year before he had normal mobility of the knee.

Case 3. Mr S., age 32, good habits. While at work in the woods he fell and broke the patella of his left knee. The fracture was transverse. From the history of the case there was no direct force and the fracture was evidently caused by contraction of the quadriceps extensor. The fracture was treated according to the nonoperative plan. After several months the dressings were removed. He went to work, and while lifting a heavy load the fragments separated. He was then referred to me by his physician. I found a transverse fracture with the fragments 1½ inches apart. I made a transverse incision over the space between the fragments. The joint was filled with clotted blood. The fibrous band uniting the fragments had separated in the middle. The tissues around the patella were very much hypertrophied,

due to the organization of the blood-clots in the primary fracture. The joint was washed out, and the ragged edges of the aponeurotic tissues trimmed. The fibrous tissue covering the ends of the fragments was removed and the bone exposed. The fragments were united then with kangaroo-tendon, three sutures being used. The edges of the lacerated aponeurosis were united with fine catgut. The integument was closed with silk. No drainage was used. Continuous irrigation with a saline solution was used during the operation. A firm bandage was applied to the joint and a posterior splint of strawboard immobilized the limb. The sutures were removed in eight days. The long splint was removed in four weeks. Passive motion with massage was used. The patient was allowed to walk with a cane in three weeks from date of operation, and was able to use the limb in six weeks. In four months the knee was restored to its normal function.

Case 4. Mr L., age 18, of good habits, fell on his knee, producing a comminuted fracture of the patella. The integument was contused but there were no lacerations. The joint was opened with a longitudinal incision. The fragments were sutured with catgut. The case was otherwise treated as cases 2 and 3. There was primary union and a complete restoration of the joint in three months.

Case 5. Mr L., age 25, of good habits, fell from a tree. His left leg was flexed under him. The patella was broken transversely. I opened the joint with a longitudinal incision. The technic was the same as in cases 2, 3, and 4, except catgut was used for suturing the patella. A perfect result was obtained.

Case 6. Mr J., age 50, laborer. His right patella was broken by a fall from a wagon. The fracture was transverse and was treated by the nonoperative method as described in this paper. The result was poor. The function of the

limb was not good, the space between fragments being apparently about one inch.

A record of six cases does not contemplate all the phases of fractures of the patella, but it does furnish sufficient data to justify me in claiming that the open method of treatment is a safe and efficient procedure.

Two of these cases were treated without operation primarily, and in both the result was bad. One required a subsequent arthrotomy; in the other one, while the patient is going around, he has very indifferent use of his leg. One case was treated with a subcutaneous suture, and when the patient was last seen, there was good evidence of a bony union of the fragments.

Absorbable material was used for all the buried sutures. The greatest care was taken in uniting the torn capsule. This I regard as one of the important steps in the technic.

Stimson, in his new work, says that the "Nonoperative methods furnish in the great majority of cases in which they are properly used a result which is functionally satisfactory, even if the union of the fragments is not close." With reference to the open treatment, he says: "If there was no risk, it would deserve selection in almost every case." The American Text-Book of Surgery describes a number of operative measures, but gives no preference. Dacosta rather holds to the nonoperative treatment, but mentions several methods of operating, placing special stress upon Barker's method. Dennis, in his "System of Surgery," speaks of the operative treatment, but points out the dangers that may arise therefrom, and describes at length the nonoperative treatment. Wharton and Curtis, in their book, say: "The results obtained by the more conservative methods of treatment are usually satisfactory, and it is to be remembered that there is a definite amount of risk in exposing the patella and opening the joint," and further that no one is justified in suturing a fractured patella unless he is in a position to

do an operation in which every aseptic detail is carried out. These authors all give great prominence to Malgaigne's hooks, and the various splints that have been used during the last half century.

Conclusions:

1. The results of the nonoperative treatment are unsatisfactory, both as to long confinement and functional disability.

2. The methods of maintaining apposition of the fragments by external appliances are unsatisfactory and unscientific.

3. In open arthrotomy the fragments can be carefully approximated and sutured in such a manner as will maintain apposition and promote bony union.

4. The operative method saves months of confinement and gives permanent results.

5. The buried suture material should be absorbable, such as catgut or kangaroo-tendon.

6. The field of operation should be continuously irrigated with a hot salt-solution during the manipulation, and the incision closed without drainage.

7. The massage treatment begun at an early date is an important factor in restoring the functional activity of the joint.

DISCUSSION

Dr C. A. Hamann, Cleveland: Mr. President: The doctor has certainly had very good results in his cases, but I question very much the advisability of the treatment being adopted by the general practician or even by the general surgeon. To one who has seen its disastrous results, the procedure does not appeal very much. I have been so unfortunate as to see three deaths following this operation. Particular care was taken in the operation. In two of the cases the circumstances were particularly distressing, and that may have prejudiced me. But I would hesitate very

much before suturing the patella. Now the patella is only a sesamoid bone and it does not make much difference whether the union is by bony or fibrous tissue. I think I would prefer some other method of treatment than suturing. In the cases where there is a compound fracture of course one would suture the fragments. The age of the patient has something to do with it also, and the constitutional condition and the time of the operation. I would like to ask the doctor whether he operates at once or whether he first allows the inflammation to subside. The New York surgeons, for instance Phelps and Weir and Stimson, operate upon scores of cases. Phelps I believe reported 104 cases not long ago. Fracture of the patella must be very frequent in New York. In the hands of these surgeons the operation seems to be safe, but in dissipated patients, such as we see in hospitals, I would hesitate much to resort to the operation, and I would hesitate also in private practice.

Dr J. F. Baldwin, Columbus: If I understood the doctor correctly, of these six cases two did badly, that is one required an arthrotomy subsequently, and one is not well yet. So there were only four successful.

Dr Means: No; there were five successful cases. One treated by the nonoperative method entirely now has a bad knee. One of them was operated by Dr Barker's method; the other four were by this method.

Dr Baldwin: I know something of the doctor's results and certainly they have been very satisfactory. But like the last speaker, who stole some of my thunder, I think the constitutional condition of the patient, the time of the operation, and the age of the patient should be carefully considered. For instance in the case of the Prince of Wales, I do not know whether it was because of his habits, his age or what, but the surgeons there advised other treatment, and I have no doubt they did wisely.

For a year or more I have been using annealed iron wire, tinned, in surgical work. I first used it in a case of compound fracture in which I wished to wire the ends of the bones together and wished something stronger than silver wire. I selected the annealed wire and it worked so satisfactorily that I commenced using it whenever I wished to use wire of any kind. It is much more satisfactory in every

way than silver, while its cost is merely nominal. The tin gives good protection, the wire itself is wonderfully strong and does not easily kink. I think if surgeons come to know of its value they will abandon the silver wire entirely. I use it in closing the abdominal incision to bring the fascia into exact apposition. I introduce it by means of a silk carrier, and after it is once introduced pull it straight in order that there may be no trouble in its withdrawal. When thus straightened it acts very much like a skewer. Dr R. B. Hall, of Cincinnati, who saw me using it, at once adopted the idea and reported upon its use very favorably to one of his local societies. I usually leave it in for ten days or two weeks, when its withdrawal is accomplished without difficulty.

Dr W. J. Means, closing: Mr President: I am fully aware that in advocating the operative treatment of fractured petallas exclusively, I am taking advanced grounds that are not sustained by a large majority of the profession. If you will observe however the advance that has been made during the last decade, you will not be surprised at the stand I have taken. I quoted from DrWyeth's book of 1887 to demonstrate the advance that has been made in the last twelve years. I feel that my experience, and that of many other surgeons has been sufficient to warrant me in advocating the open treatment. I feel however that there should be in all of our text-books some qualifications, because every physician is not competent to make an open arthrotomy. I quite agree with the gentleman that there may be cases that should not be operated upon. I would hesitate very much to operate upon a fractured patella or a dissipated person. I again would hesitate to operate where the separation of the fragments is less than half an inch; but when the separation is an inch and upwards, and the joint is filled with blood, I believe an open arthrotomy is the safest treatment. I have seen the baneful results of the operation, and therefore venture with my eyes open. I believe that an open arthrotomy is much safer than aspiration, or the use of Malgaigne hooks, which are given such prominence by some surgeons in our text-books. If the nonoperative treatment is used, I would resort to external appliances alone, and leave the integument perfectly free from any wound. As to the time of the operation, I believe in operating just as soon

as the patient can be got ready. I would make the operation under continuous irrigation of a hot salt-solution. I have no further suggestions to make relative to the technic.

EDEMA AND ELEPHANTIASIS OF THE EXTERNAL GENITALIA, FOLLOWING REMOVAL OF THE INGUINAL GLANDS

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My main object in preparing this paper was to report an unusual and, so far as I know, unique sequel of an operation for the radical cure of femoral hernia—namely lymphangitis and edema of the *labium majus*.

The patient, a middle-aged lady, was kindly referred to me by Dr W. H. Humiston, with whose assistance I operated. The hernia had been present for about a year upon the right side. No truss had been worn. On November 27, 1898, the hernia could not be reduced. On the succeeding two or three days she had a little nausea. Upon November 28 the sac was found to be about as large as a walnut, tense and painful, and gave no impulse on coughing. She was therefore advised to have the operation done at once.

Upon making a vertical incision over the hernia it was seen that the sac was covered only by integument and superficial fascia. No intestine was in the sac—only a club-shaped piece of omentum and some turbid fluid were present. The omentum was ligated and cut away, the stump being returned into the abdominal cavity. In freeing the sac and exposing Hey's and Poupart's ligaments, there was necessarily considerable disturbance of the abundant loose fat in that locality. This fat and perhaps 3 or 4 small saphenous lymph-glands were therefore removed. Three sutures of chromicized gut were passed through Hey's ligament and then through the fascia over the pectineus muscle, after the method of Bassini. Upon

tying these the femoral canal was found to be fairly well closed.

The patient's recovery was quite uneventful, the wound healing by first intention in about ten days. She was kept in bed nearly three weeks.

About three weeks after she had got up, she had an attack characterized by chilly sensations, fever (up to 102° F.) and by a painful swelling of the right *labium majus* and the area about the lower end of the inguinal canal. The wound and the tissues about it were not involved. Under the use of hot poultices the attack subsided in three or four days. She has since had seven or eight similar attacks coming on at intervals without apparent cause. For the past five weeks there have been none.

In each attack there was a brawny induration of the parts, which did not pit upon pressure, redness of the skin, with itching and pain, usually accompanied in the beginning by fever and chilly sensations. No suppuration ever occurred. The last attacks were less severe than the first. There is now but very slight enlargement of the part. The *labium minus* was not involved at any time. The inflammatory attacks bore no relation to the menstrual period. No abrasions affording access to microorganisms were seen.

I regarded the case as one of lymphangitis, accompanied by lymphatic edema, due to the interference in the lymph-flow produced by the removal of the glands and fat, and by the cicatricial contraction.

But why should these attacks come on in this case, in which so few glands were removed, and no suppuration occurred, while complete extirpation of the inguinal glands, even upon both sides is so seldom followed by like consequences?

The patient was of course greatly annoyed by the repeated inflammations and anxiously inquired as to the ultimate outcome. I told her that an elephantiasis of the

vulva might result and that there was no way of preventing it. Fortunately this has not yet developed. She was told to massage the parts in the intervals between attacks.

This sequel of an operation for femoral hernia was quite unknown to me and in a quite extensive search of the literature I have failed to find similar cases. Upon inquiry among surgical colleagues I heard of no such complications. Dr W. B. Coley of New York, and Drs John B. Deaver, Edward Martin, and G. G. Davis of Philadelphia, write me that they have not met similar cases.

To be sure it is not a very serious occurrence, yet it is quite annoying to both patient and surgeon to have such a condition follow, particularly if *elephantiasis of the genitalia were to result.*

In operating for the radical cure of femoral hernia I do not see how one can avoid removing some of the saphenous glands, and some of the loose fatty tissue which is usually so abundant about the saphenous opening; the sac of a femoral hernia is nearly always surrounded by more or less fat and in order to thoroughly expose Poupart's ligament and the *fascia lata,* prior to the introduction of sutures, considerable dissection must be done. If the fat and glands are left there is danger of interference with the healing of the wound and of sloughing.

The obliteration of the femoral canal that is sought to be accomplished in the Bassini method, must narrow or close the lumen of the large lymph-trunks, some six or eight in number, that pass through it—yet I have never heard of edema being produced as a result. It is remarkable that removal of lymph-glands by operation, or by suppurative processes and the obliteration of large lymph-vessels, comparatively seldom gives rise to interference with the return flow. In my case the glands removed were part of the saphenous group and also perhaps the inner glands of the horizontal inguinal group. These are the ones that receive the lymphatics from the external genitals

and consequently one might expect lymph stasis after their removal.

The fact that the large lymph-trunks from the lower extremity pass through the femoral canal would lead us to think that femoral hernia would be likely to cause obstruction of these channels by pressure, or that the operation for the radical cure of the hernia in which an attempt is made to close the canal, would be liable to be followed by edema of the lower extremity; yet such a sequel is, as far as I know, never encountered.

Removal of the cervical lymph-glands is never followed by edema or elephantiasis so far as I know. Nor is the removal of the axillary glands followed by edema—and but rarely do we see disturbances after extirpation of the inguinal glands. Cohnheim states that complete removal of all the lymph-glands in the posterior extremity of the dog does not result in stasis of lymph.

The explanation of these facts is to be sought partly in the frequent anastomoses of the lymphatics, an obliteration of one set of vessels being compensated for by the anastomosing channels. Furthermore the blood-vessels can take up the lymph, provided there is no excess of transudate. That there is not infrequently a communication between lymphatics and veins has been shown by several careful observers. Petrel has seen them communicate with the portal, renal and azygos veins. Stenson describes one emptying into the superior cava; Schmiedel one into the internal iliac vein; Verneuil one emptying into the axillary vein; Meckel into the inferior cava and *vena porta* (Curnow, *Lancet*, Lond., 1879, pp. 510.); Leaf (The Surgical Anatomy of the Lymphatic Glands, Lond., 1898) has described direct communication of lymph-vessels with veins in the inguinal region. In some half a dozen dissections of the inguinal lymphatics I have failed to find these.

There are no intraglandular anastomoses between lymph-channels and veins as has been believed by some

observers. The perivascular lymph-spaces also afford a means of escape for the lymph.

Again, as will be more fully explained later on, after removal of lymph-glands regeneration occurs in the periglandular fat. Thus it will be seen that there are numerous reasons why lymph stasis does not result in the majority of cases when glands are removed, though why stasis *occurs in some* cases is not clear.

At the present time removal of the inguinal glands which are enlarged and the seat of suppurative processes is frequently practiced. This procedure is as a rule eminently successful. The cure is much more rapid than if the abscesses are merely opened—the entire mass can be removed, the wound sutured and primary union obtained. In several cases I have obtained primary union even though pus escaped into the wound cavity. When the individual glands are examined it will often be seen that in the center of the gland there is an abscess; often there are several foci of suppuration. Such cases of inguinal adenitis are, as is well known, due to gonorrhea or chancroids—at times they are tubercular; often there is a marked periadenitis, and complete removal of the infected area is then hardly possible. Adhesions to the saphenous vein and to the femoral sheath render the operation difficult and dangerous, and I have known death to follow a wound of the femoral vein made during operation.

The lymphatics of one side of the body communicate with those of the opposite side, and at times a large vessel from the penis will be seen to decussate, as it were, with its fellow. In three subjects in which I recently dissected Scarpa's triangle, I found several glands fused into a large flat mass, and on the superficial aspect of this mass was a groove in which lay the long saphenous vein. In one case a large vein, the internal femoral cutaneous, passed through the glandular mass, being completely imbedded in it.

The large lymphatics which drain the lower extremity,

external genitalia, buttocks, anal region, perineum and lower abdominal wall, pass through the femoral canal; I have usually found from 5 to 8 of these large lymph-vessels in the femoral canal. In two instances I have found one or two lymph-vessels pasing up on the outer side of the common femoral artery, and lying upon the *fascia lata* which they pierce just below Poupart's ligament and then course along the external iliac vessels. In the illustrations and descriptions of the inguinal lymphatics I have not noticed a reference to these last-named channels.

The glands are throughout the body embedded in a considerable amount of fat; the importance of this periglandular fat will again be referred to.

Now in the great majority of cases in which the inguinal glands are extirpated, even if both sides are operated upon, no lymph stasis and elephantiasis result. Occasionally however these unfortunate sequels occur. I have seen them in three instances. What are the clinical phenomena which manifest themselves in these cases?

At a period varying from a few days to several weeks from the time of operation, the penis and scrotum (for it is usually the male sex in which the affection occurs) become swollen. There is a rather firm edema of the parts, a sensation of fullness and distention is complained of by the patient, and there is at times slight redness accompanied by itching and pain. The swelling may or may not subside. It is followed by other attacks, accompanied often by fever. These repeated inflammatory attacks, in which there is perhaps a reticular lymphangitis, are, as well known, seen in cases of elephantiasis of the extremities. They resemble erysipelas, but their relation to this disease has not been clearly determined. As in elephantiasis of the extremities each succeeding attack leaves the parts more hypertrophied. The connective-tissue increases in amount owing to the lymph stasis and thrombosis of the vessels and consequent hypernutrition of the tissues. Thus gradually a condition of elephantiasis develops.

In some cases these inflammatory attacks do not occur, but there is a gradually increasing edema and overgrowth of the subcutaneous connective-tissue. Dilated lymph-vessels (lymphangiectasis) and lymphorrhea may be met with.

References to these cases of lymphatic obstruction after gland extirpation in the groin are rare in surgical literature. Lauenstein, (*Deutsche Ztschr. f. Chir.* Bd. 35, pp. 573.) reports 183 operations but does not mention that he encountered these sequels. Riedel (*Arch. f. Klin. Chir.* Bd. 47, p. 216.) records two cases, both males, and the distressing consequences of the operation caused him to abandon the procedure and to substitute for it incisions and curetting. In Esmarch and Kulenkampf's extensive work on elephantiasis are found numerous cases of elephantiasis of the lower extremities and genitalia associated with glandular inflammations, but none that were consecutive upon operations for the removal of the glands. I am confident however that the cases are not so rare as would seem, and an extensive inquiry among experienced surgeons would doubtless show that the complication is frequent enough *to merit consideration* when the operation is contemplated.

Bayer (*Prager Ztschr. f. Heilkunde*, Bd. VI, pp. 105, and *Arch. f. Klin. Chir.* Bd. 49, pp. 637) brings out some very interesting and important facts in regard to the regeneration of lymph-glands, which have a bearing upon the subject.

He points out that all lymph-glands are normally surrounded by adipose tissue which forms a covering for them; usually a more or less distinct though thin connective-tissue lamina invests this periglandular fat. This periglandular fat and areolar tissue contain an extensive system of lymph-spaces and are to be looked upon as a part of the lymphatic system. In this tissue regeneration of glands and vessels occurs. Bayer showed this both experimentally as well as by the examination of cases in which there had been a new formation of glands, as in secondary carcinoma. I shall not detain you in describing in detail the histologic proofs

of these statements, but shall give the conclusions at which Bayer arrives:

(1.) After extirpation of lymph-glands there occurs a regeneration of the same under certain circumstances.

(2.) If regeneration does not occur it is likely that the lymph-flow is reestablished through collateral channels.

(3.) The formation of new glands occurs within a relatively short time (3 to 6 weeks).

(4.) Regeneration is influenced by the mode of healing of the wound.

(5.) The newly-formed glands develop in the fatty tissue. If now at the time of the operation this fatty tissue is removed, or if extensive suppuration leads to its destruction, or if repeated erysipelatous attacks, which lead to an obliteration of lymph-spaces, occur, this regeneration is materially interfered with, and the consequences above described may result. On the contrary, if the fat is allowed to remain and if primary union is secured, the circumstances are favorable for regeneration.

Hence Bayer advises that the fatty tissue, or part of it, be, if possible, allowed to remain, and that every effort should be made to *secure primary union* of the wound.

The valuable observations of Professor Bayer are therefore worthy of being borne in mind by the surgeon, though in many cases it will be impossible to leave the fat and to secure primary union. Prolonged suppuration must necessarily occur at times.

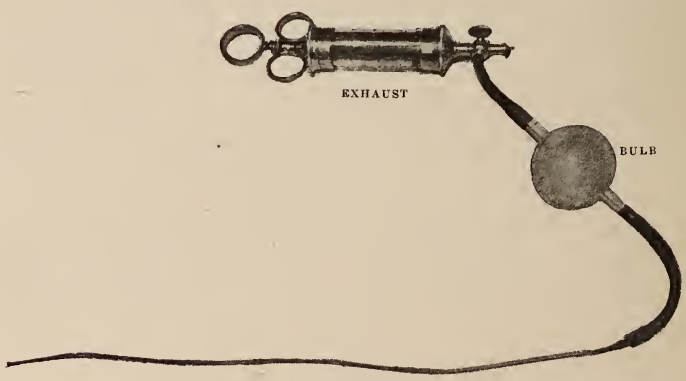
We cannot tell in any given case whether lymph stasis and elephantiasis are going to occur or not. In some cases the conditions for its development are most favorable—yet no trouble results. In others there may be edema when we least expect it.

The treatment of the condition when once developed is very unsatisfactory. There is nothing that can be done to reestablish the lymph-channels. Excision of parts of the hypertrophied skin and fascia affords about the only relief that we have to offer.

A DEVICE FOR WASHING OUT THE PELVIS OF THE KIDNEY THROUGH THE URETER, WITH REPORT OF A CASE

L. B. TUCKERMAN, M. D., CLEVELAND

This device, it can hardly be called an instrument for it is merely a combination of appliances found in the armamentarium of almost every practician, consists of a No. 6 French catheter, an ounce bulb, and the common exploring aspirator with the ordinary 3-way stopcock, all connected by



rubber tubing. The catheter is introduced in the ordinary manner through the Kelly speculum. It is necessary to use a stylet in the catheter, passing the catheter up as far as possible, then withdrawing the stylet a couple of inches, passing the catheter farther and so on, until the pelvis of the kidney is reached. Then by exhausting, the contents of the pelvis of the kidney can be drawn into the bulb and in-

spected, and by the amount of fluid which is drawn into the bulb we may judge of the capacity of the pelvis of the kidney. If pus be present and it be deemed advisable to wash out the kidney, the bulb can be detached from the catheter, filled with boric acid solution, or such other disinfecting fluid as the practician may deem best, and reconnecting and reversing the stopcock, the fluid can be injected into the pelvis of the kidney; again withdrawing, new fluid reinjected, withdrawn, until as in washing other cavities the fluid comes away clear. Then if it be desirous to medicate the pelvis of the kidney, the bulb can be filled with the proper quantity of medicament which in its turn is forced into the pelvis of the kidney where it is left by the withdrawal of the catheter.

This device I have used in a recent case. She had double pyelitis with the right kidney plainly palpable. The right ureter was occluded, or nearly so. In two sittings I succeeded in passing a catheter up to the pelvis of the kidney, and at three sittings dilated the ureter to 8 French. From the pelvis I exhausted an ounce of pus, washed with boric solution as above described, and filled the cavity with a one-ounce solution of ichthyol. At the next sitting the ureter was found perfectly unobstructed, and the capacity of the cavity would be reduced to about 3 drams.

The patient is a hopeless case as far as cure is concerned, as microscopic examination of the pus from both ureters reveals the presence in each of tubercle bacilli, but the patient was improved after the washing out of the kidney; and in a case of pyelitis of gonococcal origin it would seem as rational and as feasible to treat the pelvis of the kidney by so flushing it as to treat the bladder itself.

Chapter V—Ethics and State Medicine

MILK AS A CARRIER OF INFECTION.

C. O. PROBST, M. D., COLUMBUS
Secretary of Ohio State Board of Health

Milk is the sole thing uniting within itself all the necessary elements of food. Its use is almost universal; directly or indirectly it is the cause of many of the ailments of man. By skimming or watering its fat may be reduced to a point no longer fitting it for a food, where no other form of nourishment is taken. By use of preservatives which inhibit or retard digestion it may work harm in many cases, even when other food is taken.

Aside from the dangers to public health in this direction, we have in milk a vehicle admirably fitted for conveying to man many of the disease-producing microorganisms. Some of these, when introduced into milk, simply live there without increasing in number. Others find in milk conditions favorable for further growth. This is eminently true of the organisms producing diphtheria and typhoid, diseases frequently communicated by milk.

Any of the water-borne diseases may be carried by milk, and unfortunately the most common adulteration of milk is the addition of water. This would be bad enough if the water were pure, but quite frequently the water is badly polluted. It has been shown that by merely washing the milk-cans in polluted water the milk may be contaminated and thereby produce disease.

There are many ways by which milk may become infected when diphtheria or scarlet-fever occurs in a family which is producing milk. The mother, caring for a sick child, may infect the milk in preparing it for market. The

milk may be kept in the house, or in a milk-room communicating with the house in which the patient is ill, and the milk be contaminated by an infected atmosphere. Flies carry infection. Diphtheria or scarlet-fever may be communicated from house to house by the milkman, the infection coming from one of his customers. This may be by means of milk-tickets or by milk-bottles.

The surfaces of pasteboard milk-tickets used for some time are quite dirty and often a little sticky, offering a good resting place for microorganisms. I have seen mothers give their babies milk-tickets to play with; and babies invariably carry everything to the mouth. It is quite common for the housekeeper to place her milk-vessel out of doors ready for the milkman, with the ticket left in the vessel. In some places milkmen are required to use destructible milk-tickets not to be reissued, a practice to be encouraged. Milk-bottles taken into a house where there is diphtheria or scarlet-fever may easily become infected, and especially where milk has been ordered for the patient and the bottle is taken into the sick-room. Unless milk-bottles are sterilized, not simply washed, after coming from such houses, they may be the means of introducing disease into some other family.

The diseases so far spoken of all come from the accidental contamination of milk *after* it leaves the cow. Of perhaps more importance and interest is tuberculosis, in which the milk ordinarily is infected *before* it leaves the cow.

It may be taken as an established fact that milk, as drawn from the udder of a tuberculous cow, may contain the specific cause of that disease—the *bacillus tuberculosis*. It is furthermore well proven that this organism is the same as that found in human tuberculosis, and that tuberculosis may be communicated from animals to man or from man to animals through the medium of this bacillus.

There is not a unanimity of opinion as to whether the milk of a tuberculous cow will contain this organism if the

udder is unaffected. The Royal Commission on Tuberculosis of England, which reported in 1898, leaves the question in some doubt, though calling attention to the fact that a tuberculous cow with a healthy udder may very rapidly take on disease of that organ and thereby become dangerous. In a report on the Infectiousness of Milk, published in 1895 by the Massachusetts Society for Promoting Agriculture it was very positively shown that milk from tuberculous cows with healthy udders may contain tubercle bacilli. The bacilli in these experiments were found in the milk and identified by the usual staining-methods; by feeding-experiments upon rabbits, calves and pigs, the disease was also reproduced by such milk. In all cases the freedom of the udders from tubercle was proven postmortem. It may be accepted, I think, as certain that a tuberculous cow even with a healthy udder may infect her milk; although infection is much more frequent after the udder is involved.

The degree of prevalence of tuberculosis among cattle in the United States is not known. It has been variously estimated at from 10% to 20%. This is probably not too high for our milch-cows.

What measure should be taken to prevent disease attributable to milk? We cannot depend upon competition or the honesty of the producer for assurance of healthy milk. There must be supervision of the milk trade, and this naturally belongs to the health authorities. In the first place there must be a legal standard below which all milk must be considered as adulterated. To insure milk of this standard there must be frequent examinations of the products of the different dairies, and of the supplies of the milk-shops. Such examination of milk is fairly well provided for in large cities. The state should provide for the examination of samples of milk from smaller towns where facilities for testing milk cannot well be provided.

But what measures should be taken to prevent milk-

distributed diseases? Let us consider first that class of infectious diseases conveyable by milk in which the cow is not at fault. Here the milk as a rule becomes infected because of the presence of infectious disease in the milk-producer's family, or in those handling the milk: or by adding water to the milk, or using water for washing milk-cans or utensils which contain the specific organisms of disease.

As there is no practical way of detecting infected milk except by its effects upon the users of it, it is plain that this danger can be guarded against only by systematic, rigid inspection of the dairy itself, and of persons handling milk. The laws of Ohio make provision for such inspection. Section 2133 R. S. provides that "The board of health may appoint such number of inspectors of dairies, slaughter-houses, shops, wagons, appliances, food and water supplies for animals, milk, meat, butter, and substances purporting to be butter or cheese, or having the semblance of butter and cheese, and such other persons as may be necessary to carry out the provisions of this chapter, define their duties and fix their compensation; and such inspectors may, for such purpose, enter any house, vehicle or yard; and the board of health shall keep for public inspection a record of the names, residences, and place of business of all persons engaged in the sale of milk and meat, and may require permits, after inspection, to vend either milk or meat. (O. L. vol. 90, p. 91).

This law is imperfectly enforced in a few cities in Ohio but is quite generally ignored.

The milk-trade can be properly regulated only by enforcing the permit system. Before granting a permit there should be a most thorough inspection of the dairy, including the cows, their food and water supply, the stables, milk-house and manner of caring for the milk.

Congress, for the protection of the District of Columbia, has gone further than this in providing that no dairy

can be established within the District without a permit; and this is only granted where the dairy conforms to the requirements of the Health Commissioners. By right, such a system should apply to the entire country. In any event permits should be renewed annually after inspection; and there should be frequent inspections between times.

The water-supply is deserving of special attention. It is no uncommon thing to find wells in barnyards being used for dairy purposes which are considered unfit for domestic uses. The milk-house should be completely cut off from both stable and dwelling house. There should be provision for the sterilization of milk-vessels and utensils by boiling water or steam.

But little attention has been paid in this country to the construction of cow-stables. Frequently they are dirty, if not filthy, dark, unventilated buildings, filled with noxious odors, in which milk in open pails must inevitably become contaminated in a very short time. In no place that I know of, except in the District of Columbia, have our authorities attempted to regulate the construction of cow-stables. Such regulation is quite general in many European countries where matters of ventilation, lighting, drainage, structural material, etc. are all required to be in accordance with model by-laws. This question will be taken up again when reference is made to tuberculosis.

Filth does not give rise to infectious diseases though it may help preserve and propagate the cause of them. The greatest danger is from the presence of typhoid, scarlet-fever and diphtheria in the families of milkmen, and the accidental infection of their milk product.

This is a difficult problem to solve. In some of the best of the large foreign milk concerns handling the milk from many farms, the dairyman is paid for his milk during the whole time he has an infectious disease in his family, but the milk is not used. In this way the temptation to conceal cases of such diseases is removed. We can

scarcely expect this of our milk dealers, at least not for the present.

Physicians are now required by law to report all cases of contagious disease to the local health authorities. A city might furnish to rural authorities a list of the names of all persons living in their jurisdiction who furnish milk to the city. It could be made the duty of these local health authorities to promptly notify such city of the appearance of an infectious disease in the family of such dairymen. A heavy penalty should be fixed for selling milk under such circumstances without the permission of the health authorities of the place in which the milk is sold.

Provision might be made at creameries for using suspected milk in some manner requiring a continued high temperature which would remove all danger and avoid total loss to the producer.

Where the dairymen faithfully cooperated with the health authorities it would perhaps not be necessary with proper isolation and care of the patient to stop the sale of milk.

As far as possible the interests of the dairyman should be considered as well as those of the general public. By the enforcement of penalties, and by revoking the permits of persons who knowingly violated the laws regulating the sale of milk, the dangers from infected milk could be considerably lessened.

A different line of procedure will be necessary to prevent the sale of tuberculous milk. We have seen that a considerable proportion of our milk cows are tubercular. To what extent the use of tuberculous milk is accountable for tubercular diseases of children I am unable to state. That it is an important etiologic factor no one will deny.

To prevent the sale of tuberculous milk we must stop the use of tuberculous cows for the production of milk. This has been attempted in some cities and states but with only partial success. With the tuberculin test it is possible

to detect the presence of tuberculosis in the cow in probably 96 to 97% of all cases, but the test does not show to what extent the animal is diseased. However no animal even with incipient tuberculosis should be used for the production of milk.

The state under its police powers doubtless has the right to provide for the inspection of all milk cows and to prohibit the use of those shown to have tuberculosis. It may condemn and slaughter such animals for the protection of the public health. A city may require the dairyman to furnish satisfactory evidence that all cows producing milk which he sells in such city are free from tuberculosis or other dangerous communicable disease. In the case of the city of Minneapolis the Supreme Court of Minnesota decided that the municipality could require that all cows furnishing milk for that city should be shown to be free from tuberculosis by the tuberculin test; and that this is a reasonable method for detecting this disease.

We can never hope, in my opinion, to stamp out tuberculosis among milk cows in this manner. We may lessen the number of cases, but so long as the conditions which *produce* bovine tuberculosis remain we will never eradicate the disease from our herds. Cows under natural conditions in the open, rarely have tuberculosis. It is the dark, filthy, unventilated cow-stable that is principally responsible for the spread of tuberculosis among dairy cattle. It is true that the tubercle bacillus, necessary for the production of the disease, is not *generated* there, but, once introduced, it meets all the conditions favorable to perpetuate itself there, and finds in the tissues of the cow kept amidst such surroundings a soil in which it really grows. And it must not be lost sight of that tuberculosis may be communicated from man to animal; so that if it were possible to at once destroy every tuberculous cow in this country, the conditions would remain which would again start up the disease among dairy animals.

We must attack this question then from two sides—we must eradicate animals already diseased and remove the conditions which would cause the remainder to become affected. In combating the conditions which give rise to bovine tuberculosis there must be a revolution in the construction of cow-stables. They must be light, clean and well ventilated. There must be no over-crowding, a sufficient amount of floor-space and air-space being allowed for each animal. To properly control this matter of sanitary construction of dairy stables it will probably be necessary for minimum requirements to be made a part of our state laws.

Koch and others have shown the wonderful effects of sunlight and even diffused daylight in destroying tubercle bacilli, yet how few of our cow-stables are lighted. The relation of bad ventilation to the production of tuberculosis in human beings is well known. It is no less a factor in causing this disease in animals.

There is an excellent reason why cow-stables are not ventilated in cold weather. A temperature of 60° will diminish the yield of milch-cows as much as 10%. As stables are almost never artificially heated in this country, the entrance of fresh air *because it is cold air* is prevented in every possible way. There is no escaping the conclusion that if cows are to be properly housed in this climate their stables must be artificially heated in winter. In no other way can proper ventilation be secured and the yield of milk be kept up to a paying standard.

The cost of this need not be prohibitive. In an excellent article on Dairy Sanitation by Dr John C. McVail, Medical Officer of Health of Glasgow, he estimates that the cost of apparatus for heating and ventilating a stable large enough for twenty cows would be forty pounds; and that the cost for fuel for six months—taking their average winter temperature at 40° F. would be about twelve shillings per cow. This sum, forty pounds, was the cost of

putting an old stable in proper condition. Apparatus for heating and ventilating a stable could probably be put in at the time of its construction for a less sum, even in this country. Hot water is one of the first requirements of a dairy, and the boiler to supply heat could economically supply hot water.

The true solution of this question of eradicating tuberculosis in dairy cattle, is to put it on the ground of self-interest for both the consumer and producer. The city of Buffalo is meeting with considerable success in this direction by simply publishing in the daily papers a list of the names of dairymen whose cows have been found free from tuberculosis by an inspection by the health department. This inspection is made at the request of the dairymen.

Let the physician and the sanitary officer create a demand for healthy milk by keeping constantly before the public the danger of using milk from tuberculous cows. Enterprising dairymen will meet this demand and force their competitors to do likewise. But more than this, the dairyman must be made to realize that a tuberculous cow is worth less to him than a healthy cow: that it is a loss for him to buy such a cow, or to have animals he already owns become affected; that by tuberculin he can detect the disease even in its incipient stage and take necessary precautions to protect himself against such loss. He must be led to believe that the extra expense of properly constructing and heating his cow-stables will yield an interest on such investment.

The task of educating the dairyman and his customers to this view of mutual interest in the production of pure milk will be, as I have had reason to learn in attempting sanitary reforms in other directions, a long one, and judicious *forcing* measures must be gently applied until that happy condition is reached.

While the question of tuberculous meat is outside the limits of this question, I would allude to it briefly from the

fact that when a cow has become unfit for the dairy from having become tuberculous, it is frequently sent to the butcher. We are learning that incipient tuberculosis in man readily yields to proper treatment under favorable surroundings. This is equally if not more true of tuberculosis in cattle. Our farmers should know that many of their tuberculous cows may be saved and returned cured to the dairy. By frequently testing a dairy herd with tuberculin the disease will be caught in its early stages; and by promptly withdrawing cows but slightly affected and placing them where they cannot affect others, but where they may find plenty of fresh air and at the same time shelter when needed, many of them will recover. If cows are slaughtered because of tuberculosis we should adopt the Berlin plan of having the meat placed in the hands of the public authorities to be made safe for consumption by heating, and sold at a reduced price so as to prevent a very considerable loss.

To sum up in a word the measures needed for protection against milk-infections, we need:

Frequent inspections.

A license to sell.

A remodelling of cow-stables and the hearty cooperation of the dairyman in self-interest.

DISCUSSION

Dr W. J. Means, Columbus: I would like to ask the doctor what plans or methods the State Board of Health has taken for regulating the test for tuberculous cattle by the use of tuberculin. I know that they have discussed it at the meetings, but whether or not they have decided upon any plan by legislation or otherwise I would like to know. I think it is a matter which concerns us all.

Dr Probst: I might say that the State Board took up this matter a few years ago with the United States government and endeavored to have them furnish tuberculin for making tests of dairy cattle. With that end in view we succeeded in interesting one of the largest dairymen in the State, the firm of French Brothers of Cincinnati who handle

the products of many thousands of cows. They were willing to have all of their cows tested provided the Bureau of Animal Industry agreed to furnish tuberculin; but when the Bureau finally made it a condition that all cows that were found to be tuberculous should be slaughtered, a post-mortem examination made and the report sent to Washington, that regulation could not be complied with by French Brothers because this firm did not own the cows.

Dr Wm. H. Humiston, Cleveland: I thoroughly agree with the sentiments of the gentleman that tuberculous milk is a very bad thing, but there is one other thing that is destroying children in our cities, and that is the filthiness of the milk—the dirt which is in the milk through carelessness in milking and its after-care. Now I have often thought that if our Boards of Health or Medical Societies could have communication with these dairymen, their places could be inspected and this dirt and filth which is such a menace to our children could be got rid of. This filth could be largely avoided if the ordinary methods of cleanliness could be used and I believe that we can do something along this line.

Dr John P. Sawyer, Cleveland: I believe no more important subject could be chosen than this of dissemination of tuberculosis by milk, and I noted particularly in Dr Probst's paper one sentence which brought to my mind more forcibly than ever before the idea that we are not to blame the animals for being tuberculous when in reality our animals are tuberculous because of their association with "us humans." We need to be very explicit in teaching in our communities the importance of the dissemination of tuberculosis through the medium of tubercular sputum and discharges. As snow-balls grow, so public information is increased, and public practices of abuses are abated by the united action of small bodies of men who realize the importance of these things. And if we as a body of physicians throughout this state were to say today that we personally would use no milk excepting that from cows to be found not tuberculous it would do more to influence public opinion than active and energetic legislative measures. I would suggest that we physicians make a practice of making examinations of cattle from which we are furnished milk.

Dr H. J. Sharpe, London: I consider this one of the most important matters that concern us as physicians, particularly in regard to our association with our clientele. I live in a section of the country where we breed fine cattle

where we have blue-grass pastures, and where we have fine babies, I must say that even in that part of the country we depend largely upon rearing our babies on cow's milk. It is becoming more and more the custom, and I think it a good custom where we have healthy milk. It is found there that we have a large number of milk cows which are tuberculous. There is no method or means by which you can determine that unless you use the tuberculin test. We have no law behind us to enable us to use it. Health officers may instruct, they may in a few cases prevail upon persons keeping cows to use it in a very few cases in the cities, but you cannot reach them in the small places or in the country. I think that this Society before it adjourns should have this subject brought well in hand. We need legislation upon this matter. There is no use trying to control this unless we have behind us the law enabling our health officers or inspectors of dairies to take hold of this matter and have this test made by the use of tuberculin. We have our Secretary of the State Board of Health who ought to have his attention called to the fact that we have shipped from our county adjoining Franklin every season perhaps hundreds of old cows which are not fit for meat. These are slaughtered and sent to Columbus for the consumption of the people there. A great many of these animals are evidently tuberculous, cows that respectable sunshine would not make a shadow for. Not long ago I met one of my clients bringing in two old cows. I saw that he had with him one of those men who are engaged in buying up cows. I asked him where he was driving those cows. He told me that he was driving them to London to be slaughtered for Columbus people. One of the cows was eighteen years old and I do not believe there were eighteen pounds of meat on her. The people of Columbus had the meat.

I believe that many of our infants contract tuberculosis through the use of tuberculous milk as received and used from the cows. I have seen Jersey cows so pale and thin looking that the wonder is that they will give milk at all, yet they are constantly milked and we have it distributed among our people for our use. Jersey cows give good milk and people like the milk because of the cream.

We have a committee on legislation but it does not amount to much in pushing special legislation. Let this be a special committee and let them get together before this meeting is over. I expect to have something to say on a

bill that will be introduced towards strengthening our medical profession in protecting our people against this terrible disease of tuberculosis.

Dr J. A. Thompson, Cincinnati: I think the profession generally has overlooked the significance of the data furnished by Woodhead of London in regard to the method of infection in tuberculosis. As the result of twenty years of postmortem experience he stated in a paper published in the London *Lancet* that one-third of all the cases of pulmonary tuberculosis were infected by food through the tonsils and the lymphatic tract in the upper part of the throat. The other two-thirds were infected through the lymphatics of the intestines, and the lungs were never primarily involved. He also stated that he had never known a case in twenty years' observation unless the lymphatics at the base of the lung were first infected. Tuberculosis disease spreads primarily through the lymphatic system. This is the so-called pretubercular stage where there is no evidence of the disease in the lungs and when the patient is little by little becoming anemic, with the general health greatly impaired.

I had a patient under observation in this stage of the disease in whom I had made a diagnosis of beginning tuberculosis. The man had a temperature of perhaps 100° in the evening, he was weak, was getting anemic, and did not feel able to attend to his business, although he went every day. He had a catarrhal laryngitis which did not progress toward recovery as it should have done. After a careful consideration of the case, and after I had been over the lungs (two others also went over them) nothing could be found; but at that time he was suffering from this tuberculosis of the lymphatics. I told him he must get into the mountains, and he refused to follow my advice. He had been under my care three months when I found a little spot which was developing in his right lung. Three weeks later his sputum was loaded with tubercle bacilli. He still refused for quite a time to try the benefits of climatic change, but finally went to Colorado staying only a short time. He is now back in the city with a temperature of 105°. There is no doubt but that the infection was primarily through the intestinal tract and from thence through the lymphatics to the lung. This question of the manner in which persons are infected with tuberculosis is really the most important one in the matter of the spread of tuberculosis. A most important item in

treating a case is to remember that the lymphatic system may be infected, and the disease may be slowly progressing for months without any local lesion in the lungs. Woodhead is thoroughly correct in his declaration that you never find the lung involved until the lymphatics are pretty thoroughly diseased. I called the attention of Dr Lyle to these suggestion and he said that they explained something he had observed in postmortems, but did not understand. That was that the disease in the mediastinal glands was so much older than that in the lungs.

Now if we who are practicing medicine will fix these facts thoroughly in our minds, that two-thirds of the cases are infected through the intestines and never primarily through the lungs, and tuberculosis is a disease primarily of the lymphatics, we can do much more to prevent the spread and to cure this disease than if we consider tuberculosis to be primarily a disease of the lungs.

Dr H. J. Sharpe: I take it for granted that a body of men and women like this is convinced that tuberculosis may be conveyed by milk. I believe as a body we believe this thoroughly. The question now is how to bring this matter before the people. Now if we have physicians who do not believe in vaccination with all the proofs that we have, and do not stand for that procedure in the prevention of smallpox, how can we get them together on such a question as the contamination of milk? And unless we can bring it to the attention of the laity we can do nothing. I think that there should be some action taken today, and if not today, in the very near future, whereby this question can be agitated not only among the dairymen, but also among the people. We should have some legislation which will uphold the State Board of Health in this measure. But there it will end unless it comes in some form before the people. I think the best thing to do is to have absolute legislation which will enable our Ohio State Board of Health to enter these dairies (and I have seen many of them around here which should not exist) and clean them out. First of all clean out the cattle-pens, and the dairy-pens, and then destroy the diseased cattle. I hope that some action can be taken by our Society in connection with the State Board of Health.

Dr C. F. Clark, Columbus: I have on many occasions heard such papers discussed before and no definite action

has been taken. The milk I am using at home is tested at intervals and I have to pay twice as much for it as is usually charged, but I know that it is pure, and every doctor should see to it that the milk which comes into his family is inspected to see if it is pure.

Now I am going to offer a resolution, that the president appoint a committee consisting of Dr Probst as chairman, and one or two others, to confer together here in Springfield relative to some active legislation on this subject.

[This motion was seconded by Dr Oliver and followed by a discussion by Dr Tuckerman.]

Dr L. B. Tuckerman, Cleveland: It would seem that there ought to be embodied in that resolution some means by which this State of Ohio can produce the tuberculin that it needs to take care of its own cattle so as not to be dependent upon some outside party, and the regulations which some outside party prescribes. I would suggest to the Chairman of the Committee, Dr Probst, that that matter also be considered by it.

Question by *Dr H. J. Sharpe:* Does the State Board of Health contemplate the introduction of a bill in the Legislature at its next session?

Answer by *Dr Probst:* No definite plan has been formulated by the State Board in that matter. I tried to bring out in my paper that the test by tuberculin and the slaughtering of the cattle, if nothing further is done, is the wrong idea, for it only covers part of the ground, and as long as we permit the cattle to live in the conditions in which they now do, so long will they develop tuberculosis.

I will add one word more. I do not wish to underestimate the value of further legislation on this subject, but I am inclined to believe that bodies like this that do not have practical experience in enforcing the law, are inclined to over-estimate what can be done by having a statute passed by our Ohio State Legislature. We have now some fairly good laws on this subject which are not enforced on account of the lack of a proper sentiment behind them. We must make the people understand the necessity for such legislation, and this should precede the legislation itself. I wonder how many physicians in this hall have taken the pains to visit the dairies from which they get their milk. There is a way, if physicians are really in earnest in this matter, of

educating the people, and you should all be interested enough in this matter to do it. Let every physician called upon to recommend dairies for furnishing milk for children inspect the dairies they recommend. You would then know where to get pure milk, and the dairy-men would "catch-on," as the saying is. I would urge upon the physicians to make inspections of the dairies, and that will be an education not only to the physician himself, but also to the people who are using the milk, which will make it easy to make and enforce laws for the production and sale of pure milk.

THE ATTITUDE THAT SHOULD BE ASSUMED BY THE MEDICAL PROFESSION TOWARD CHRISTIAN SCIENCE AND ALLIED FADS

JOHN CHADWICK OLIVER, M. D., CINCINNATI

The past history of medicine has furnished many and diverse anomalies in the line of methods of treatment, and the present day has brought many queer practices to light. By an odd coincidence most of the modern vagaries have for their basis a religious idea or thought. They endeavor to supplant material treatment by a spiritual or religious agency. At least the advocates of these methods endeavor to use the bible as their text-book on modern medicine. An effort is made to substitute the word of God for the efforts of man, and hence the very natural conclusion that the agency of man is entirely unnecessary and even presumptuous.

It is a great mistake upon the part of the medical profession to ignore these peculiar people. It is equally unwise to abuse or uselessly antagonize them. Some of them are honest in their beliefs and it should, therefore, be the aim of physicians to educate and elighten them. Harsh criticism and ill-advised scolding will do more to upbuild their numbers, to convince them of the animosity of physicians, and

cause them to pose as martyrs, than any other course that can be adopted.

Let us then meet them on the field of reason and common-sense! Let us inquire as to the *principles* upon which their claims rest, and then dispassionately review the subject from a common standpoint.

The first step in this consideration is to remove the religious or superstitious element from the discussion. Does the Bible anywhere teach that men must rely upon the supernatural and leave out of consideration the natural? Is there anywhere the assurance given that natural and temporal means are of no avail?

It is beside the purpose of this paper to go into an exhaustive theologic discussion of the subject for two reasons, *viz.:* first, theology is somewhat out of our line, and second, it is entirely unnecessary to go into this phase of the subject because all of the claim for supernatural intervention (one might almost say interference) can be much better and more clearly explained by the knowledge we possess of the ability the human body has of combating disease, and of restoring itself to a condition of health.

The result, therefore, attributed by these believers to divine intervention is more correctly interpreted by the medical profession to mean that the Creator has so constituted the human body as to render it able to throw off certain indispositions without assistance. The "*vis medicatrix naturae*" has been known and worshiped by physicians for many, many decades. The more we know of this subtle and peculiar power of regeneration the more we admire and use it. To a logical and well-informed mind this is the foundation-stone upon which all "christian science," "divine healing," etc., rests.

There is another element that enters into these fads, and that is "faith." Far be it from the medical profession to decry the utility and necessity of this element. Each one of us knows that faith or trust or confidence in one's

physician is a very important factor in the battle with disease. Faith in God is very commendable. Faith in man is also necessary and essential.

Each physician strives to so conduct himself as to gain the confidence or faith of his patient, and he knows the great value of this to the patient. We often hear sick people say, "Why! Doctor, it makes me feel better just to see you! Come again tomorrow." Many and many a time does a physician relieve his patient by his conversation and presence more than by the remedies prescribed, and often no medicament is at all necessary. This is the result of "faith."

The third element to be considered is the *mental diversion* wrought by having the patient fix his (usually her) mind upon some other subject than the disease. The late Dr Comegys frequently remarked that he had often been able to accomplish seemingly wonderful cures (?) by obtaining the patient's promise not to discuss his ills with anybody, not even to refer to them, for twenty-four hours. At the expiration of that time the promise would be extended; and so on until the mind was diverted from its constant dwelling upon one subject, and the ills would thus gradually sink into insignificance.

Mental diversion is perhaps given its widest application in the "Weir Mitchell treatment," and every successful and intelligent physician is ready to bear testimony to its efficacy in a certain class of disorders. The result is brought about very largely through the personal influence of the physician upon the patient, and the beneficial effects are rather heightened by the omission of drugs. You may call this power whatever you please, but you cannot deny its existence.

Before passing from this phase of the subject let me remind the members of this Society that these fads are not new, they are but slightly modified manifestations of the curious ideas that have gone before. Homeopathy, I mean the regular old-fashioned brand, when analyzed was found

to rest upon the tripod of "*vis medicatrix naturae,*" faith and hope. In this mode of treatment the faith was not of a religious nature.

Some of us, nearly all in fact, will go farther than do the "faddists." We can truthfully say that many, many sick people will get well without prayers and without drugs. The self-limitation of many diseases is much more thoroughly understood by physicians than by "Christian scientists," and our faith in the accuracy of our knowledge is very profound. The mortality in patients treated (?) by "Christian Science" will be just the same as the death-rate among those receiving absolutely no medical treatment—nay, it will be higher because they may become so much interested in their prayers as to neglect to obtain good nursing and proper diet. The early homeopaths were much wiser because they devoted careful attention to dietetics.

It may therefore be admitted that the *principles* which underlie "Christian Science" are good and that they have a real foundation in fact and experience. It should also be admitted that physicians have for centuries recognized and used these same aids in the treatment of disease. There is nothing new in the scheme except the mysticism and unwarranted perversion of scripture.

Now having admitted that their claims for a certain percentage of recoveries have a veritable existence, we must point out to them that they are misleading themselves and others as to the source from which recovery comes. The idea of the "Supreme Being" interesting himself in each and every case of illness is a very pleasant one, and very comforting to one's idea of his own importance. It really adds very much to one's self-conceit; but alas! there is not one iota of evidence to prove that these people are especially anointed of the Lord, or that they recover their health in any larger proportion than do the very outcast and scum of creation; in point of fact, one may safely say that the more worthless (apparently) an individual the more likely he is to regain health and strength.

Thus far we have journeyed along very amicably, the only difference being that we eschew any supernatural agency in accounting for the phenomena of recovery from disease, while our friends attribute to a *divine* agency what we know to be the result of purely natural forces. We substitute the "*vis medicatrix naturae*" for divine intervention, but admit the efficacy of faith, hope and mental diversion. Up to this point our views are so similar that no serious disagreement need arise—we believe in the same things but call them by different names.

The foregoing ideas constitute the entire armamentarium of Christian Science. They now stand still, perfectly content with their very meager view of the possibilities of medical science, never dreaming but that they know it all. Happy in their ignorance they complacently hug this little bit of knowledge to their breasts and fondly delude themselves into the belief that there is nothing beyond. Physicians take these same ideas as a starting-point from which to project long lines of patient, painstaking research. Surgery with its long vista of possibilities opens up before the assiduous labors of the physician and he is enabled to save thousands of lives which would surely be lost were he to rely upon a policy of waiting, watching, praying, hoping and having faith. Thousands of hideous deformities are removed, blind eyes are made to see—the beautiful young child choking to death because of the presence of a cruel membrane in its throat is restored to its parents through the knowledge brought about by scientific experimentation and careful welding together of observations. The mother whose life is endangered by malposition or dystocia of her unborn babe is saved from a cruel, painful death by the application of medical knowledge.

Many, many similar examples can be quoted to show the beneficent mission of the medical profession, but why multiply instances? If it can be shown that the medical profession is cognizant of the principles which underlie

Christian Science, and that they know much more, then the deduction is irresistable that Christian Science is a proof of the old saying that "a little learning is a dangerous thing," and that in many cases it is the most unchristian cowardice, and the most devilish mockery.

Now one great mistake made in discussions similar to this is that physicians have allowed themselves to make intemperate and illy-considered statements, and have given their opponents the opportunity to pose in the light of martyrs tied to the stake of custom, and subject to the cruel fire of prejudice. This is a strong position to occupy before the public, and particularly the American public, because they love fair play, and usually take sides with the "under dog in the fight." Homeopathy would not be alive today were it not for the impetus received from its alleged persecution by the regular profession.

We should, therefore, learn from our past mistakes and not repeat them whenever we are given an opportunity to do so. What do we gain by denying any and all merit to the "fads" under discussion? Would it not be a much more sensible course to acknowledge that the powers of nature will give an appearance of truth to their claims, and then gently and kindly lead them to realize that physicians have employed these identical means for hundreds of years, and still employ them, but that they constitute but a part of the grand science of medicine?

Would it not be well, in view of the fact that they rely upon *faith* and *hope*, for us to add the other virtue to the trinity and have *charity* for their narrow, superficial and superstitious belief?

Let us therefore convince them and all the world that breadth of knowledge breeds magnanimity and charity for the errors and superstitions of those to whom the light of science is unrevealed. By education they may be led to see the great harm they are doing both to the cause of religion and to the cause of honest scientific endeavor. May we

not trust that each physician will feel it his duty to act as a missionary among these benighted brethren and that he will kindly and patiently seek to woo them by reason from the false gods of superstition and ignorance, for these are the foundation upon which they build? Or, failing in this laudable ambition, would it not be the part of wisdom to ignore their existence and thus quietly allow them to depart to that oblivion which enshrouds the remains of previous delusions and neurotic vaporings?

DISCUSSION

Dr P. M. Foshay, Cleveland: I do not think that we should allow Dr Oliver's paper to pass without some discussion. It is a very important subject, and I for one am very glad that we had this paper presented at this meeting. The proper way, I think, to treat these people is to ignore them.

I have been much struck with an article referring to this matter in the last number of the *Journal of the American Medical Association,* also some articles which have appeared in the May *Arena.* The time has come apparently when the followers of the faith cures are quarreling among themselves and the evidence produced in this last number of the *Arena* shows it to be a "false god."

Dr C. A. L. Reed, Cincinnati: I want to speak on this paper; this subject is a sort of specialty of mine in which I am very much interested. The discussion of this question to my mind is eminently a proper one. We are confronted by a condition and not a theory. These people exist, these people have their beliefs, and these people are practising their beliefs to the detriment of themselves and the members of the community. Their relations are not the relations of physicians to the public at large. They do not wait to be asked, but they thrust themselves in and assume the responsibility of patients, and determine the welfare of the unfortunate individual who happens to come under the ægis of their influence and in that way they are much more mischievous than one would at first imagine. Of course as far as their doctrines are concerned and observed they are grotesque, when not criminal. So far as their beliefs are con-

cerned they are essentially demoralizing in every one of their tendencies and relations. There is not associated with this movement from its inception down to the present status a single feature which does not confirm the conviction that, in its instigation and in its propagation, it is in motive and purpose one of the most arrogant species of venality ever perpetrated upon any people. In the purpose of the prime instigator of this movement we have everything in the way of dishonesty, of falsehood, of cupidity, of cunning and morbid egotism. These are the constituent elements of the woman who has perpetrated this sect upon the American people. It is a sad commentary upon the popular intelligence and popular credulity when we find people, otherwise well educated, who become the willing dupes of this combination of characteristics. I have had occasion to study this movement, to go back to the period of its inauguration coming down to the publication of the two articles referred to by Dr Foshay in the last number of the *Arena* in which we have an *expose* of the whole thing, and I am prepared to reaffirm that which I have already said with regard to the object, motive, and purpose of the woman who has instigated and fostered this cult.

Now what is to be said in extenuation of these people who subject themselves to this influence, which we recognize as essentially mischievous, if not malign? To say that some people are not relieved of functional disturbances through these means at times would be to deny the plain facts and testimony of experience and observation. There are certain persons who experience relief at the hands of these people, who at the same time are honest, but are controlled by psychic influences, which, unhappily for our profession, have not been studied with that assiduity calculated to bring the highest results. I believe with Herbert Spencer that there is a morsel of truth in things false, and some of good in things evil; and there is something of good in this movement in calling the attention of the profession to the importance of studying the psychic element and making it one of the influences for controlling the health and happiness of the people. This study has been carried on at very great length in France, particularly at Nantes, also in that great school which stands today as the most conspicuous school of psychic therapy and psychic science. But that influence must elevate the profession, and the sooner this

elevation takes place the sooner will the profession be in position by the practical means thus put at their disposal to combat this charlatanism which is propagated under the name of Christ.

Dr T. A. Reamy, Cincinnati: I doubt very much if this subject is one which comes within our province as physicians. I was charmed by the paper of Dr Oliver and also by the discussions, but I scarcely understand why medical men should take up this subject. It is one which belongs to philosophers, ministers, philanthropists, and perhaps alienists. It is simply a manifestation of that strange intellectual and psychologic aberration which has been present in the world from the beginning. I do not think that Christian Science does us any harm professionally and I do not see that it will do any special harm to those who are the followers of this "ism." It is only one of the many strange freaks of humanity. Take for example one which is of enormous magnitude today—Mohammedanism. Mohammed was driving his camel one day when he was stopped in his path and a voice said to him that there was one God and that Mohammed was his prophet, and today as the result of this man's influence and individuality what do we see? Millions of men following his leading. And had this strange founder of a creed not committed the fatal blunder of taking up arms for coercing the Christian world to his faith who can estimate what would have been the results? All of these things depend upon the peculiarity of the human mind. Christian Science is only one of these freaks which have occurred in the history of the race from the very beginning. Let it alone and it will die.

Dr F. F. Lawrence, Columbus: It seems to me if we will look into this matter a little we may find some grounds for the rather unusual culpability or gullibility of the general public. The medical profession for the past few years has quite frequently been filled up with papers written by men of considerable prominence, men who are well known as psychologists, as physicians, as men of letters, upon the subject of the treatment of disease by suggestion, and the influence of the mind over matter. These topics are catchy to the public mind, and those people using these methods will use these articles as an argument from the profession

itself in favor of their doctrine or creed, or whatever it may be called.

Another point of value at this time, which has been brought out by this paper, is the direction of the professional man to the fact that psychology should be made a part of the medical curriculum in all the schools. There is no question as to the close relationship between mental influences and physical condition. I doubt if there is a man in this room who has not seen a rapid, feeble and irregular pulse quiet down in a few moments after he has entered a patient's room simply from the presence of his trusted physician.

Another point is the question of the evil done by the undue prominence given to the effect of so-called faith. If it could be limited to those cases of purely imaginary ills where no harm could result it would be all right, but when it occurs, as it has occurred in numbers of cases, when patients are ill with serious diseases such as typhoid, or septic infection, it seems to me it is time to take some action in this matter. A few weeks ago I learned of a case of septic infection in which the people had discharged all surgical assistance and were depending entirely upon an old woman who was a long way off. There are some very amusing illustrations of the effects of Christian Science, one of two of which might not be amiss.

I was called in to see a lady who for two years had been a subject of paralysis, probably of hysteric nature. She had a cystoma of the ovary involving part of the broad ligament. I was asked by her physician to see her and make preparations for its removal, not with the idea of curing the paralysis, because I had no idea that there was any connection between the pelvic and the paralytic condition, and it was only to give relief from the local trouble caused by the rapidly increasing growth that the operation was performed. She recovered from the operation and a few weeks later she became better of her paralysis and walked upon crutches and went out upon the street. A few months later her paralysis increased. She went to Virginia to better her health. Her husband received a telegram stating that his wife's health was very much worse and for him to come on and bring her home. He brought her home and her condition became very serious. Her physician came to the conclusion that it was largely a mental illness and told her one

day that he had done all he could for her and that he was very much afraid that she was booked for eternity. That evening through some of her friends a prayer-meeting was held in her room, after which she felt better. On the following day another prayer-meeting was held, and for three or four weeks afterwards these meetings were kept up. On one Sunday morning she got up and went to church. An amusing feature of this case is the fact that a few years before for three months she had been paralyzed and she had been cured by the exercise of faith in divinity. Now consider the influence of such a case upon the public mind. How can the physician explain such a case to the public mind? Is there a way to do it? I should like if possible for the doctor in closing the subject to suggest some method of dealing with these prejudices of the human mind, as to the absence or the exercise of faith in God whether or not there be a faith in God which will cause a person to lie down and pray the Lord for something when he has already placed in our hands the power to get and have that thing.

Dr E. S. Stevens, Lebanon: The question of our attitude toward Christian Science, so-called, and kindred delusions, is one that we cannot always ignore because at times, in one way or another, it is forced upon us. There is more than one way of viewing this question. When the subject comes to us as individual members of the medical profession probably the best thing we can do is to quietly ignore the existence of such a thing as what has been termed Christian Science. When however as members of Health Boards, the Board of Registration, of which our President is a member, or of other bodies in which we are representatives of the profession, our attitude is questioned, it should be considered from another standpoint altogether. I would not have these persons *persecuted* at all, but when their practice becomes criminal—and we have such instances—may it not become the duty of such representatives of the profession to *prosecute* rather than to tolerate the practicians of the pseudoscience?

Dr P. R. Bennett, Daytona, Fla.: Just a word in regard to this matter and the growth of these cults. There is in Florida a mental-science institution with a woman at the head of it. It has grown from a little bit of a cottage in

which she lived to an immense colony with a theater, casinos, &c. Her business is so great that the United States Government has created a money-order post-office for the receipt of her mail and not another order goes out of it. It sometimes requires two teams to carry her mail to the post-office. She will agree to create a new limb where one has been amputated, at the knee for instance, and will by mail cure some persons away off in Kansas. She employs several typewriters. The fees come into her constantly. In ununited bones she will agree to knit them together for $10.00. Such fees, and larger, come in as I said, to this woman all the time, and amount to thousands of dollars. There are people who believe in it. I hear it said that we should not contradict these things. No. The well-read physician knows them all, he knows what the conditions are, and what they rely upon. It is the same thing that the homeopathic physicians rely upon in curing their cases.

Now I just want to relate the case of a child which came under my care. She was eleven years of age and had been in bed for eight months. I was called in and after examining the patient found nothing wrong with the body, and I told them there was practically nothing the matter with the child. They thought they would send for the woman and have her treat the child. I told them that I could do with a shingle all that she could do. I said "I will whip this child until it gets out of bed. I will take the responsibility of its life." I made a paddle and sand-papered it so that it was perfectly smooth. I then went into the room where the child was and told the child in a severe tone of voice that it must get out of bed and dress itself, and if it did not I would warm its jacket well for it. If that did not prove effective I promised that I would burn its back with a red-hot iron. I called the parents in and they consented to all this before the child.

The child cried for a few minutes, and I stood and waited for about thirty minutes, at the end of which time the child said that it would do what I wanted. I said that was all right and the first thing I wanted it to do was to have breakfast, which was given to it. It then asked me what I wanted it to do, and I told it to get up and dress, and that child dressed itself except the putting on of the shoes and stockings. I assisted the child and it sat up after that at my table and ate for five days. Of course the child was weak

from lying in bed so long and not using its muscles, but it gradually gained strength and is now well and strong. I examined it so as to be sure that there was no myelitis. I say these things can be accomplished by the physician and to get these results people need not go to the Christian Scientists or the Osteopathists, who are able to slip two of the vertebras back after they have been out of place.

THE NEW INDUSTRIAL POSITION OF WOMAN IN ITS RELATION TO HEALTH AND VIGOR

MARY JORDAN FINLEY, M. D., MANSFIELD

The new woman may be a myth but the new industrial place of woman is a reality. Every field of labor is now open to both sexes on nearly equal terms. Women enter business in every branch in all its ramifications. They are finding in learning, in literature and in work, not only the means of supporting life, but the happiness that makes life worth supporting.

To be a happy wife and mother will always be the highest ideal for every good woman; as it ought to be the highest ideal of every good man to be a happy husband and father. But marriage and motherhood are not all of a woman's life, just as marriage and fatherhood are not all of a man's life.

The permanency of this change is assured by the fact that it is primarily an economic one. Its coming has not been accelerated by the female shriekers for woman's rights; it will not be retarded by the male howlers for woman's sphere. It is the result of the specialism which characterizes the civilization of this age. Skilled labor, complicated machinery and new motive powers have taken the work formerly done in the home, and divided it among many special industries each carried on most successfully in large establishments. It is the overthrow of household industries in competition with specialized manufactures that has

forced women into the general industrial field. Steam and electricity, which have revolutionized economic conditions, are revolutionizing the social fabric. A recognition of its economic character is necessary to enable us to appreciate the irrevocableness of the change which is taking place. A change which, once fully inaugurated, must effect in some measure all the relations of life. By it women are placed in a new environment to be wrought upon by new influences, mental, moral and physical. As physicians we are deeply interested in the effects which these changed conditions are likely to have upon the health of women and on the strength and vigor of the race.

Pessimists have bewailed the disadvantages of the new activities; the exposure incidental to many employments, the strain of competition in business and labor, the mental application necessary to success and so on. Let us see if there are not compensating advantages, which give us reason to hope for a more vigorous womanhood with a progeny less numerous perhaps, but better bred. In the passing regime are many things that could not fail to be detrimental to mental and physical well-being.

Indoor life is enervating; idleness and aimlessness are not conducive to health. Uncongenial employment is depressing mentally and physically to either man or woman. To oversee a modern household of the well-to-do, or to accomplish all the work of the poorer, is enough to employ well one woman in a family and no more. That every woman should like housework is no more to be expected than that every man should like farming.

The financial dependence of the sex, assumed in all cases and real in the majority, has entailed an amount of annoyance, chagrin, humiliation and suffering that has contributed largely to nerve-tire, hysteria and lowered vital tone. No matter what her inherited means or how much work she did in the home, the woman has been considered dependent on the man who is the head of the family be he husband, father, brother or son.

By the wife and children well beloved, this was perhaps never felt, but to the unloved wife with unwelcome children, to the widowed daughter, the sister, the mother, the old maid aunt, the mother-in-law, it became too often the bread of bitterness. When the woman's living and social place depended on being loved, the winning of affection and holding it, became the most important thing in life. To please some man and keep him pleased was a task which often gave her more care and anxiety than would be required to conduct a large business enterprise.

Fear, envy, jealousy, anger, grief and all the depressing passions of "this little fiery colored world" were bred in her with no outside interests to turn her thoughts in healthier channels. The emotional was cultivated to the general detriment. If she failed to win or keep love she must look to pity for a living and to gain sympathy she would exaggerate her little ills to mysterious illnesses until she herself believed in them. What wonder if she became the hysteric mother of defective daughters.

The social necessity of marriage forced women into uncongenial unions, which brought unhappiness and consequent lowered vitality to both parties thereto. It led to marriage with men who were morally and physically unfit to be husbands and fathers. It induced an undue preponderance of the sex element in the life of women.

The idea that man is the unit of humanity and woman the complement to a part of his nature, that she exists only for his happiness and the reproduction of the species, dominating society under conditions that imposed idleness or a narrow range of duties on women, has led to a morbid sex-consciousness in both men and women, and an over-stimulation of the emotions and affections in women. The normal equilibrium, between physical, mental and moral, has been disturbed, to the detriment of the entire organism. Women have been taught in the family relations to yield their will, to see their opinions disregarded and their judg-

ment set aside. The tendency of this has been to weaken the will and to render the judgment vacillating. It is impossible to foresee how far-reaching may be the social effects of the economic revolution, but it is already evident that these things are changing for the better. Industrial self-support brings with it social independence.

The mental stress to which women are subjected in industrial pursuits is such as to tax thought, rather than feeling, to develop strength rather than induce weakness. The trouble has long been that women thought too little and felt too much. Business life cultivates the judgment, the will, the reasoning faculty. It necessitates self-control and tends to correct the predominance of the emotional nature. It brings a desire for respect and admiration rather than for love or pity.

Higher education gives more healthful mental discipline and a broader horizon with more varied sources of happiness. Diversified interests distract the mind from injurious indulgence in grief, from the exaggeration of trifles, from hypochondria, and hysteria. Wider intelligence and better business methods engaged in housekeeping, the choice and preparation of foods and the care of children, must be of incalculable advantage to the family.

The exigencies of an active life will necessitate more healthful dressing at least for business hours. Women will be more out of doors. The girl who only goes twice a day to and from an office or a shop, gets at least that much more out-door life than the one who spends all day in housework, gets that much more exercise than the one who spends the day at home sewing, gets that much more change of sights and sounds to take her out of herself and give a healthful stimulus to the nervous centers.

Able to choose from a greater variety of pursuits each may find some occupation in which she can take pleasure and interest. Managing her own estate or paid for her work, she will not be subjected to the irritation of begging

for her own. When marriage is no longer necessary as a means to gain a livelihood or to escape odium, it will become more an equal pairing, with common interests, and equal rights, duties and responsibilities. The independence thereby secured to woman in the marriage relation will be one of the strongest possible safeguards for her own health and the health and vigor of her offspring.

The double standard of morals by which we measure men and women is responsible for many suffering women, feeble children, and childless wives. When the economic independence of the sex is fully assured, they can demand of men with whom they marry the same purity that men demand of women, and in time there may come a single code of morals by which impure men and impure women, alike debarred from marriage, may herd together outside the bounds of decency, unlikely to perpetuate their kind.

I have spoken of the new industrial position of the sex. It is not new, it is old as the race. It is a return from artificial to natural conditions. Throughout nature the struggle for existence engages equally male and female. Among all primitive people women have borne an equal share in the battle of life. Agriculture and manufactures, as well as the preparation of food, were women's work among the Indians. The peasant women of continental Europe work in the fields side by side with the men, and in Vienna many of us have seen them digging sewers and carrying the hod up the walls of buildings that rival those of Chicago in height. Generations of toil have given to those women a powerful muscular development. The patients in the gynecologic clinics did not come from that class.

Something of moral refinement, something of physical charm, women may have gained by being relieved from the racial struggle, but they have lost in development of mental and physical strength. "The home is woman's sphere," we are told, but with all the varied activities that once centered there taken out of it, except the last steps in the preparation

of food and the promotion of cleanliness, it becomes too narrow, monotonous and aimless, it affords too little of either mental stimulus or muscular activity. Kept within it, the woman's thoughts, interests and sources of happiness become too much centered in her sex-relations, her position as wife, mother or maid.

Social conditions which have tended to specialize the human female as a merely reproductive organism have not produced a vigorous womanhood.

I am convinced that the causes of the peculiar susceptibility of our women to pelvic disease is to be found, not in the individual, but in racial degeneracy, the result of an artificial condition of society, a faulty environment, leading to perverted innervation and trophic change.

Imperfectly functionating pelvic organs are stigmata of degeneration, if you will. Women need a new environment. They need to be wrought upon by new influences, which will stimulate equally and tend to develop symmetrically all the faculties of the mind, all the functions of the body. Such an environment they will find in the world of work which is now opening to them, such influences in its imperative demands.

DISCUSSION

Dr Thad. A. Reamy, Cincinnati: I have been charmed by the paper read by its distinguished author and have followed carefully her thought. To a very large amount of the doctrine I would heartily subscribe in my head and heart, but in my judgment it contains some doctrine which is not only radically wrong, but which if carried out would cause most disastrous results, and it is the duty of everyone to protest against such views.

All that she has said in reference to woman earning her living when necessary I most heartily subscribe to, and I am even in favor, as my friends know, of women voting, not limiting their vote to educational measures alone. I should not say a word against women entering the ministry, medicine, law, etc., if they want to do that.

In the wonderful facility of expression and prompted

by the inspiration which carried this author on, she was led to write in that paper this declaration—"These circumstances which are created tend to exaggerate woman's emotional nature and her affections."

Great God! has the time come when in the interests of woman's advancement the fullest development of her emotional and affectionate nature shall be discouraged? That the fruits of the supremely distinctive qualities which alone can qualify her for being the mother of the race shall be suppressed? Who does not know that woman is more emotional, more affectionate and more religious than is man? Who does not know that these qualities in her have an anatomic and physiologic basis? I repeat it—Let her be educated in science, literature and art. She has shown her intellectual capacity to be fully equal to any task in this direction. She has measured powers with man in our universities and higher seats of learning and without loss in the comparison. Let her therefore teach, instruct, make literature, create art, enter the learned professions. Give her the widest latitude, put no bar in her way, help her, encourage and love her. But do not emasculate her of the distinctive features which make her so lovely, so good, so pure, so holy. Leave her as the helpmeet, the inspiration of man! As she is during the period of gestation she regulates her own life and sustains her offspring in embryo, breathing into its nature her own spirit of gentleness and love, continuing it after the child is upon her lap and at her knee. This is the hope of the world, here is woman's power. A power that the world cannot dispense with—but which will be lost to her if the doctrine here criticised is carried out.

How is it that the woman you love can help you most, the woman who is your wife, the mother of your children, the mother of her race, when you come home tired and sick at heart after you have been disastrous in business? The world is against you, your business ventures are gone, you are stranded and you are poor. How can she help you most? Is it by telling you that she will go into the field, that she will undertake the business? Ah, no. She looks into your face and says that she will do without this thing and without that, that she will go to the theater less often than she did, and that she will deny herself many things to which she has been accustomed. She tells you she will love you as ever, and in that wonderful fountain of love you find

strength and encouragement, a heroism which makes you strong to go out again and fight the battle. Then when a man comes home from business he does not want to have a rival in business and a judge standing over him to tell him what to do. He wants to drink and feast at that fountain of love, the family circle, and gather strength that will make him capable of fighting the most terrific battles, that will lift him out of discouragement, away from temptation and disgrace. How many times men have been tempted to go astray and have gathered strength when they came home and found that sympathy and affection burning bright on the domestic hearth and they have said in their hearts how precious is this wifely love to me—I have a treasure, I have a home, I have loving children—with such influences they can resist any temptation.

So man is saved. We are answered that this is a selfish view, that it is in the interest of the man. Not so. Every physiologist and observer knows that all of the physical passions are, other things equal, stronger and more dominating naturally in man than in woman. He is the father of the race. If she in her refinement and sweetness and loveliness and religious nature can restrain man, modify his temperament, lead him upward to a loftier plane of life, and all this in the exercise of her holiest qualities, is it selfish to permit her to do it? God pity our race when woman's heart shall be hardened, her emotional and affectionate qualities dwarfed.

Dr J. F. Fitzsimmons, Bucyrus: It seems to me that this is a question as to whether the wife or the husband shall have fair play. It is a question as to whether your wife or your daughter has a right to engage in the labors of this life, whether she has a right to assist in the development of the home, and whether she has a right to choose a home or not. I claim that she is the type of creation, she is the only one to whom we can look in the matter of the development of childhood and youth. Do we not trust her in the government of the family, can we not trust her in the social life, and can we not trust her in any field of labor in which she chooses to go? I only ask for my wife and for the wives of my friends that they shall have fair play and an open field to contest in this world of ours. I want her to have the rights of life, the rights of happiness and the right to pursue any honorable calling in life. Is this detrimental to her life? I

claim that it is not. I claim in the diversity of labor that she will find many means of recreation, and also that engaging in many of the labors that men engage in she will not lose her womanhood or her affection and self-respect. This is not a question of sentiment either, but rather one of utility and greater usefulness for womanhood.

Dr E. A. Harper, Columbus: I wish to congratulate Dr Finley on the noble stand she has taken for herself and the new woman. I do not mean by the new woman, the woman who hopes to copy the follies of man or his wearing apparel to emancipate herself. Not the woman who would wage a war of strife and centention with man. She is not new. She is as old as civilization itself. What I mean by the new woman is she who is prepared to take her place in the race for the good of the race, and the elevation of humanity. She realizes that it is her high and divine privilege to be the mother of mankind and that hers is the enormous responsibility to shape and control the destiny and perpetuity of the race. She realizes that there is no loftier mission on earth than to fashion the character and train aright the intellect of the growing child. She realizes that the budding boy is the coming man. She realizes that the mother is largely responsible for the traits of the child, and that it requires no more time to learn and love the ways of purity, than to learn the ways of vice and iniquity. She realizes too that proper training is the best preventive of perversions of every kind. She has established and is all over the country conducting branches of the greatest institution in American history, I refer to the kindergarten.

In regard to our educational institutions I believe that she should have a voice in the control of these institutions. I think that the women deserve great credit for the stand they are taking.

Dr L. F. House, Sinking Springs: We have had some practical experience at our house as to what woman is able to accomplish. My mother raised four of us, my father having died when we were very young. She ran the farm, and in fact did some of the farming herself and thanks to her careful management she is now enjoying herself in California.

Dr Mary J. Finley, closing: I was deeply interested and touched by the eloquent address of the gentleman from Cincinnati. When he speaks we all listen with pleasure to whatever he may have to say. If he will allow me I will

make one correction. I said "the over-stimulation of the emotions and affections in women." I heartily agree with the doctor in much that he has said. We have however looked at the subject from a different standpoint. I have not been concerned as to whether it would make men happier. I have looked at it entirely from the point of view of the health and happiness of women. This the doctor has completely ignored. He has pleaded eloquently against any change which might render women less capable of ministering to the happiness of men, but has had nothing to say about its effect upon women. That they may be healthier and happier apparently does not concern him.

Dr Reamy interrupted with the remark—"My wife is the happiest woman in the world."

I do not doubt it. I have said that to be a happy wife and mother will always be the highest ideal for every good woman. But all good women are not happy wives and mothers. Many fail to find domestic happiness. They do not marry, or they marry men who cannot make their lives happy, or they are not happy in their children or household duties are exceedingly uncongenial to them. For these women shall there be no other source of happiness, no other interests, no other activities?

I have studied this matter from the feminine point of view. I do not believe that woman exists solely for the happiness of man; and I deprecate that habit of mind which sees in all changes of the status of women only its possible effect on the comfort and enjoyment of the other sex.

THE DISINFECTION OF RAILWAY COACHES AND STREET CARS IN OHIO

FRANK WARNER, M. D., COLUMBUS

The number of infectious diseases propagated by contagious germs would seem to indicate to me the utility of the regular and periodic disinfection of railway passenger coaches and street cars operating in Ohio.

Who, traveling in any of these public conveyances, has not seen the unfortunate tubercular patient expectorating upon the floors? Who has not known of diphtheria

patients transported in these same conveyances? Cases that were perhaps thought to be only a sore throat. Is it any less true of mild cases of scarlet-fever, whooping-cough and even smallpox?

If there is anything in the contagiousness of *La Grippe*, as many excellent physicians seem to think, and think so for one reason that these cases develop and follow up the arteries of trade and travel—then there would seem to have been met another reason why these vehicles should be regularly disinfected.

The advancement in the method and extent of cleaning railway coaches in the past few years is very commendable indeed, and I know railway officials are entirely willing to do anything that is within reasonable bounds of expense on the one hand and practicability upon the other. One railway system alone spent $62,000 last year in cleaning their coaches operating in this state. A little more money added in the item of disinfection, it seems to me, could be profitably spent.

At the same time we are adding to their expense of cleaning why not try and lessen the extent to which they are compelled to clean, that is if we can practically abolish the filthy habit of expectorating upon the floors. Much has been done in that direction.

One of the largest systems of roads operating in Ohio has agreed with me to introduce cuspidors in their smoking-cars if the State Board of Health will only pass a resolution prohibiting expectoration upon the floors. In conversation with me, a prominent official of this same road said that if only such a resolution were passed, which of course carries with it a penalty, they would see that it was enforced. Perhaps a few arrests would be required, but this would only have a wholesome effect, and result in less cleaning to be done and with much better results.

Even if such a resolution were passed it could not reasonably be hoped to absolutely abolish occasional expec-

toration upon the floor; and this too from the most dangerous class, the ones afflicted with pulmonary tuberculosis. The danger from this expectoration is not immediate, for it must first have ample time to dry and finally get into the air as dust is raised in the car. Even after the floor is washed up, many germs may remain in the crevices, and later find their way to the air which the passengers breathe.

How shall the disinfection of a car be done? Shall a gas be generated which will fill every crevice of the car? Or shall we content ourselves with a germicide used in water in washing the floor? While the latter method of treating a car would accomplish something, it is not an ideal one, for the cushions and other portions of the coach do not come in for any share of disinfection.

The generation of formaldehyd gas reaches all crevices and parts of the coach. Ample experimentation has been made to show its effectiveness. It does not destroy any fabrics, even the most delicate, nor does it remove any colors such as we would encounter in these coaches.

Young, in a reprint of the Tenth Report of the Maine State Board of Health, quoting from experiments made by Dr Kinyoun on formaldehyd gas, says that "of 225 samples of wool, silk, cotton, linen, leather and hair, subjected, there was no change observed in textile character, even when they were soaked in a strong solution of the gas. Little if any change occurred in the color of the fabrics; only three of the number showed any change. These were shades of violet and one of light red. These were coal-tar colors, and were also quickly bleached by the sun."

Ample proof has been offered by different experimenters of the effectiveness of formaldehyd gas in destroying germs even when situated in very large spaces. The same gentleman in the Maine report, quoting Dr Bosc says, in one of his experiments, "Trillate autoclave was set up outside of a ward in a contagious disease hospital. This ward was more than 50 feet long, and had open doors

leading into two adjoining rooms at the end opposite to that at which the autoclave was placed. The combined air-space of the three rooms was more than 26,000 cu. ft. Three liters of formalin were used; autoclave in action two and one-half hours; only the larger openings around the doors and windows were closed. The germs were *staphylococcus aureus, bacillus coli,* diphtheria, glanders, pyocyaneus, anthrax spores, etc., dried on pieces of linen, placed in various parts of the rooms and at various heights in the large and one of the small rooms; some, covered; some, open. At various places also, dust from the laboratory of pathologic anatomy, earth from the courtyard, tuberculous sputum on linen, and mixed with sterilized sand, and some only partially dried, or humid, were placed. Some of the samples were exposed five, others, 24 hours."

"The results were that all pathogenic germs exposed to the gas on pieces of linen, dried or partially dried, and in all parts of both rooms, large and small, were destroyed; the laboratory dust was sterilized, the earth from the pavilion developed *B. subtilis* and *B. mesentericus.* Staphylococcus in the pocket of a coat was killed, but *B. coli* in the same pocket presented a scanty growth on the fifth day. Staphylococcus under a pile of clothing, not destroyed; and *B. anthrax* in the center of a mattress was not destroyed; staphylococcus between the layers of a folded mattress, sterile; *B. tuberculosis,* dried on linen, in sterilized sand, and in fresh sputum on clothing, was killed."

In order to put formaldehyd to a practical test, in the disinfection of railway coaches, I requested Mr E. G. Horton, Bacteriologist for the State Board of Health, to make certain tests with a comparatively small amount of formaldehyd. The day we had selected turned out to be a very unfavorable one for tests of this sort. The wind was quite strong, which made the amount of ventilation from the coaches great, consequently diluting the strength of the formaldehyd gas which we generated with a sanitary for-

maldehyd regenerator. The gas was generated on the car platform and inducted to the car through a tube inserted in the keyhole. Mr Horton had placed in the car various cultures to test the effect of a given quantity of the gas upon them.

Following is his report: "The gas was obtained by means of the Sanitary Formaldehyd Regenerator from commercial formalin. Two regenerators were used and they were operated by Mr Colton of the Columbus Pharmacal Company. Two railway coaches were used in the test. The doors and windows were closed and no other precaution was taken with them. The other openings of the car, ventilating shafts, closet openings, etc., were closed by filling the openings with waste. Three species of bacteria were used, *staphylococcus pyogenes aureus, bacillus prodigiosus,* and *bacillus pyocyaneus.* The cultures were made upon glass rods and upon squares of car plush. After exposure the cultures were washed with a weak solution of ammonia, then with water and then fresh culture media were inoculated with them and observed for ten days. The control cultures were subjected to exactly the same treatment except the exposure to the formaldehyd.

Test No. 1.—April 13, 1899: Weather, bright and clear; temperature, inside, 24.5 deg. C.; outside, 26 deg. C.; wind, south; velocity 12 miles per hour; relative humidity, 85.

Car No. 161, P., F. W. & C. R. R. Vestibuled. Capacity 4055.6 cubic feet, with no deductions for furniture. Formalin used, 24 ounces.

No. 1 Regenerator operated 35 minutes, 9:53 A. M. to 10:44 A. M.; No. 2 Regenerator operated 35 minutes, 10:07 A. M. to 10:42 A. M. Consequently both regenerators were in use at the same time for 35 minutes, while one regenerator was in use 16 minutes in addition to the 35 minutes.

No. 1 Regenerator used 16 ounces of formalin; No. 2 Regenerator used 8 ounces of formalin. The test cultures were distributed through the car at various distances and heights.

One aureus culture gave no growth; one aureus culture gave a growth in four days; one aureus culture gave a growth in five days; one aureus culture gave a growth in seven days; three pyocyaneus cultures gave no growth; four prodigiosus cultures gave no growth; one prodigiosus culture gave a growth in four days; one prodigiosus culture gave a growth in six days.

Of thirteen cultures tested five gave growths. All the controls grew. Car opened after five hours.

Test No. 2.—April 13, 1899: Weather, bright and clear; temperature, inside, 26 deg. C.; outside, 27.5 deg. C.; wind south; velocity, 12 miles per hour; relative humidity, 85.

Car No. 211, P., C., C. & St. L. R. R. Capacity, 3508 cubic feet, with no deductions for furniture. Formalin used, 21 ounces.

No. 1 Regenerator operated 11:26 A. M. to 12:09 P. M.; and again from 12:32 P. M. to 12:50 P. M. No. 2 Regenerator operated 11:16 A. M. to 11:36 A. M.; and again from 12:08 P. M. to 12:33 P. M.

No. 1 Regenerator used 16 ounces of formalin; No. 2 Regenerator used 5 ounces of formalin.

The manipulation of the regenerators was very unsatisfactory, as from start to finish one hour and thirty-four minutes passed. During this period one of the machines was not in use for 33 minutes and the other one was idle for 49 minutes. The car was opened after three hours. All controls grew.

One aureus culture gave no growth; three aureus cultures gave growths in four days; one aureus culture gave growths in five days; one aureus culture gave growths in ten days; five pyocyaneus cultures gave no growth; one pyo-

cyaneus culture gave a growth in five days; five prodigiosus cultures gave no growth.

Of 17 cultures tested six gave growths. A stiff wind which was blowing was very objectionable as it interfered with the burning of the lamps and also caused much natural ventilation of the cars which were not sheltered. The machines did not work satisfactorily during the test and were not constant in their gas production. From the scientific side the conditions of the test were far from satisfactory."

With the test conducted at a time when there was a less high wind and better arrangements for closing up the ventilators for the gas or oil lights and the water-closet pipe, I am sure better results would be attained. All observers agree that you cannot disinfect with formaldehyd gas any structure which is exposed to a high wind.

I would mean to include Pullman cars along with the ordinary day-coaches. It would not be contemplated including open street-cars for disinfection if indeed we included the closed ones during the summer months; as they would be practically open during that season of the year. But that an indication could be met by requiring their regular disinfection along with passenger coaches at least during the winter months I am well persuaded.

DISCUSSION

Dr Frank Warner, closing: I shall say very frankly here that I cannot expect this society at this hour to take any action on this matter. As a member of the State Board of Health I am desirous of knowing the opinion of the society on this subject. If the society is silent, I can only interpret it as meaning that there is no desire on their part for anything to be done, consequently there is poor encouragement to go ahead. Now if the gentlemen here think that this is an appropriate matter for the State Board of Health to take up, as a member of that Board I shall be very glad to have any suggestions relating to the subject. And if

there are no suggestions, I shall simply interpret it as not being viewed of sufficient importance to warrant any action.

Dr Means, Columbus: This is a matter of great importance to the public, and should certainly receive some consideration at the hands of this Society. It seems to me that the matter should be taken up by the Society in the form of a resolution, suggesting some action on the part of the State Board of Health looking towards the disinfection of public conveyances. Inasmuch as there are only a few members present, I will suggest that further discussion of the subject be deferred until the evening session. I will then offer a resolution suggesting action on the part of the State Board of Health in this important matter.

Dr Mary J. Finley, Mansfield: Speaking of suggestions I am glad that the gentleman said "public conveyances," for I have been struck by the fact that the public hacks are often carriers of infection.

Dr F. H. Darby, Columbus: I am one of the members of our profession who hopes that this motion will prevail. Many of the infectious diseases which we encounter are carried not only in railway coaches but also in street-cars, and also as the doctor suggests in carriages. I hope some action will be taken on this subject. We are up against it in our business.

THE RELATIONS OF THE GENERAL PRACTICIAN AND THE SPECIALIST

P. J. KLINE, M. D., PORTSMOUTH

It has been truly said, "Life is short, and art is long." It is much better to know all about a few things than to know but little in regard to many things.

The field that is now covered by the practice of medicine is too large for one man to encompass or practice successfully. As a result we have two great classes in our profession; the general practician and the specialist. Both are needed, and both need one another.

There is room enough for all at the top, and the relations

of the general practician and the specialist should be of the most cordial kind. In fact it sometimes looks as though the practice of medicine was already directed in specialties, as though there was no more room for the general practician and as though what was once called the "family physician" is now becoming a thing of the past. The brilliant advances made in the past few years along certain lines of specialism have no doubt in some degree dimmed the glory of the general work. But an army always needs a commander, someone to assume general responsibility and to give general orders and so long as that is the case, so long will we need some in our profession to both lead and command. The best and most noted of all our specialists have risen from the ranks of the general practician; frequently obscure country practicians, men that were led on, as it were, by an irresistible tendency to do a special line of work. They have conferred inestimable and lasting comfort on the human family and won for themselves and the profession at large, undying renown and glory.

Unfortunately at times, the relations between the general practician and specialist are not of the most cordial character, the first often trying to hold on to a patient that should by all means have been sent away to the specialist, and hoping that something might turn to his own advantage until the patient finally makes a recovery without the special aid he so much needed.

If the family physician finds symptoms that baffle his power in diagnosis, or skill as a therapeutist, he should at once avail himself of the aid of the most skilled specialist in that particuar line that it is possibe to obtain. A consultation should always be held and should have for its prime object the welfare of the patient. Let glory and fees be an after-consideration. Too often cases are held from the specialist so long that the time of relief, let alone recovery, has forever gone by. The general practician will never gain

anything by playing the dog-in-the-manger, keeping from others that which he cannot relieve himself.

Diagnostic skill of the highest order possible should be striven for, both by specialist and family physician. If a grave malady is early and correctly made out, better both for doctor and patient. Prognosis will be of more value and ultimate results will be more assuring. Then unskillful operations with high death-rates will be less noticeable. In short, if the general practician does not know what to do for his patient, let him be generous and honorable enough to have someone called who can both see the trouble and give relief.

The specialist as a rule does not see the patient until the family physician has exhausted all his medical skill and resources upon him. Too often a cystic tumor of the abdomen is repeatedly tapped, until, if the patient lives long enough, the resulting inflammation produces adhesion, and that, which under other conditions would be a safe operation to the skilled ovariotomist, becomes one of extreme gravity. Too often children are drugged to excess for headache when an oculist would relieve the trouble at once by well-adjusted lenses. It has been said that he who looks only in the ear does not see very far up the nose; that the gynecologist only sees a uterus or a pus-tube in his patient; or that the rectal specialist has revealed to his sight all the ailments of his patient through an anal speculum. If this be the case, so much the worse both for patient and practician. But is this true? And will actual facts and practice bear this statement out? We think not. Our medical colleges are trying to remedy some of these evils by a longer and more thorough instruction in anatomy, physiology and pathology, sending forth their graduates better equipped than ever to meet the responsibilities that are sure to come to them in their professional careers.

Let all, both general practicians and specialists be as well trained as possible, both by didactic and clinical teaching. Let all work in the general field, in other words let all

make a specialty for a time at least of the general practice of medicine, and as a result all will be better fitted for any special line of work they may choose or they may perchance fall into that for which they are best fitted, both by natural qualifications and a careful and patient training.

The better trained diagnostician the family physician is the more competent will he be to decide as to whether his patient should go to a specialist for relief, and he will be able to do this sooner than he who lacks in this qualification. He should act as a finger-board, pointing the way to relief at the cross-roads of distress, when he is unable to give the needed aid himself.

On the other hand a specialist should carefully and conscientiously confine himself to the line of work he has chosen to follow. His treatment of the general practician and the ethical relations of himself to the same should be of as high an order as that which exists between specialists themselves (no stealing of other cases). The amount of his work is in no small degree dependent upon the will of the general practician, and the thoroughness and skill with which he does it.

While a man of moderate ability and skill may succeed in a reasonable degree in the general practice of medicine, in these days of sharp competition and high degree of skill, no ordinary or unskillful doctor can succeed at all as a specialist.

To the young graduate just fresh from his alma mater there is a fascination in specialism. It means to him only office hours. He needs no night-bell. He can live at his ease, even in the suburbs of the great city. He will be free from the long and tiresome and exacting hours of the general practician, whose duties and responsibilities are more exacting and laborious than those of the commonest menial about his household; who gives up all social enjoyment to be ready and able to respond to the demands of his profession. His abilities must be both varied and multitudinous; ready to treat a case of teething as it seems to the laity, or to con-

duct an attack of puerperal eclampsia, or postpartum hemorrhage to a safe conclusion. He must be ready and willing to be blessed when he little deserves it, and quietly accept of curses when not guilty. From the ranks of the humble general practician come the Dr William McClures of Ian McLaren in his "Bonny Briar Bush." In short, the general practician will always be the "Old Ironsides," "The Rock of Chickamauga," of the medical profession.

Chapter VI—Ophthalmology

TRAUMATIC CATARACT

C. F. CLARK, M. D., COLUMBUS

As the transparency of the crystalline lens is dependent upon the maintenance of the exact histologic relations of the component parts of its delicate cell-structure and as disturbance of these relations results from the least mechanical violence, chemical irritation or impairment of the nutritive processes upon which it depends for its growth and the renewal of its cell-life, it is easily understood that the slightest traumatism, if its force be expended upon the lens or its suspensory ligament, is apt to result in cataract.

Practically, however, the usual injury through which traumatic cataract is developed is one which, by some means, ruptures the anterior capsule and allows the aqueous humor to be absorbed by the exposed lens cells and to gradually disintegrate and dissolve them. In this process the lens swells and, if the activity of the lymphatic system in absorbing and carrying away the products of disintegration is not in proportion to the activity of the process of disintegration, we have an obstruction of the lymph-channels which sometimes leads to the development of a form of glaucoma.

If the wound in the capsule is large and the lens swells very suddenly, iritis not infrequently results and is attributed to the mechanical pressure, or at times, to a degree of infection, which finds in the aqueous humor, in the serum which exudes from the bruised iris and in the partially disintegrated cells, an especially favorable field for its development.

It is not my object at this time to enter upon a general

discussion of the interesting questions involved in its pathology, but to present some of the practical aspects of the subject with special reference to the early management and treatment of ocular traumatism involving the crystalline lens, and in illustration to present two somewhat typical cases.

Case 1. Miss N. H., age 17, consulted me on December 11, 1896, stating that six days before while cutting wood with which to kindle a fire she was struck on the "*closed*" lid of the right eye with a stick which flew from the hatchet. I found that her vision in that eye was reduced to light perception and that the bulbar conjunctiva was injected.

By dilating the pupil it was discovered that the anterior capsule was ruptured, the swollen, opalescent lens-substance was presenting, and, on closer inspection it was seen that in the inferior nasal quadrant there was a small perforation of the cornea about 2 m. m. in length, thus proving that what was supposed to have been a blow on the lid was, in reality, a perforating wound of the cornea.

She was sent to St. Francis Hospital with directions that the eye be irrigated with a sterilized solution of boric acid and two drops of a two-grain-to-the-ounce sterilized solution of atropin should be instilled three times a day.

She was kept in bed and strict instructions given that patches consisting of three or four thicknesses of sterilized cheese-cloth saturated with ice-cold, sterilized boric-acid solution should be kept constantly on the eyes. The boric-acid solution was maintained at a temperature a little above freezing by having the bottle containing it packed about with ice. This was continued for several days until the more acute symptoms had subsided when for the constant cold, intermittent hot applications were substituted.

Under this treatment the swollen lens-substance which welled out of the ruptured capsule was gradually absorbed, and by observing it at intervals of a few days one could see it fading away like a cloud.

When she entered the hospital I considered it probable that it would be necessary to make a linear incision and extract the swollen lens-substance, and, had the rapidity of the swelling outrun the absorption, and produced, as it sometimes does, symptoms of glaucoma, I should have done so, but, as the lens-substance was being steadily absorbed and all symptoms of irritation gradually disappeared, it was deemed better to depend upon this process alone.

At the end of eight weeks the lens-substance was reduced to a few thin fragments, the eye was quite free from injection, and she could count fingers at 20 inches. The patient was discharged from the hospital to go to her home in a distant town and await complete absorption, after which division of the capsule and the adjustment of proper glasses should give her excellent vision.

Case 2. Mr Jas. F., age 48, a boilermaker in the employ of the Pennsylvania R. R. Co. at Logansport, Indiana, was referred to me on March 15, 1899, by the Superintendent with a recent injury of the left eye. Two days before, while cutting off a burr of boiler-steel with a cold-chisel, a fragment, which he described as 1″ long, 1-16″ wide and 1-16″ thick, flew from the chisel and struck him in the left eye rendering it blind in a very short time. An inspection revealed a slightly swollen, cataractous lens presenting in the pupil which was of medium size and, at a point in the cornea opposite the nasal border of the pupil, a fine vertical line of incision about 5 m. m. long.

The pain was not severe and there was very slight injection of the bulbar conjunctiva. The cornea was clear excepting at the point of the small, incised wound. The iris was apparently uninjured.

He was directed to report to Dr Early, the hospital radiographer, and have an X-Ray picture taken, as it was feared that a fragment of steel was in the eye, but as both the plate and fluoroscope after careful scrutiny yielded negative results, we felt safe in concluding that the fragment of steel had inflicted a wound and fallen away.

He was put to bed with constant applications of ice cloths and the use of boric acid and atropin directed as in the former case.

The lens continued to swell, but under the use of ice and atropin caused no pain. By March 21, owing to the large incision in the anterior capsule and the consequent ease with which the aqueous came in contact with the lens-cells, it was in great part disintegrated and practically filled the anterior chamber. The patient could ill afford the loss of time required to bring about absorption of so large a mass of lens-tissue, and the process would, owing to his greater age, consume a much longer period than in the former case. It was therefore determined to extract, and on March 22, nine days after the injury, cocain was instilled, and, with strict aseptic precautions, a horizontal incision was made in the superior quadrant of the cornea and the lens-substance removed, as far as was found practicable, by compression and direct manipulation.

Until within a few years it would have been necessary in such a case to be content with these measures and to leave to the slow process of absorption a considerable amount of lens-substance which could not be removed without endangering the integrity of the surrounding structures by too prolonged manipulation, but in irrigation of the anterior chamber we now have a means at our command which in such cases, as in the removal of senile cataract, greatly reduces the danger and shortens the period of the after-treatment.

By the use of a small pipet, or slightly modified medicine-dropper with a fine, rounded tip, I succeeded, by repeated injection of a 3% sterilized salt-solution, in removing all of the loose masses of lens-substance that were to be seen, leaving nothing to obstruct the view of the fundus but the partially opaque lens-capsule and this was well opened in the center by a lozenge-shaped, vertical rent.

Under continued use of the ice-cold patches and atropin he made an uninterrupted recovery, and on April 3, 20 days after his injury, he returned home with 20-50 vision, which by April 18 had increased to 20-20, enabling him to return to his work with practically normal vision 35 days from the date of the accident.

It is not by the adoption of some newly discovered remedy or method of treatment that our best results are obtained, but by painstaking attention to details in the application of means which have been in use for years. Ocular therapeutics, as compared with general therapeutics, is not very complicated, and, operations aside, the thorough comprehension of a few well-established and almost universally-recognized therapeutic principles renders the rational treatment of the early stage of an ocular traumatism, not involving a serious injury or prolapse of the iris, a very simple matter.

Unless the swelling of the lens is great, there is not apt to be serious danger of glaucoma, and no operative interference is called for unless the lens is sufficiently disintegrated to allow of its removal. Our object then should be the prevention of iritis by the use of a sterilized solution of atropin, prevention of infection through the corneal or scleral wound by repeated and free irrigations of the conjunctival sac with a sterile, unirritating lotion, such as boric acid, and, perhaps most important of all, the holding in check of the inflammatory process by the free use of ice-cold applications.

At a later period of the treatment hot fomentations are of the utmost value, but we are now dealing with the early stages, and in traumatic cataract, as in other forms of ocular traumatism, while the inflammatory process is active, or before it has developed, there is no one agent in which so implicit reliance can be placed as sterilized ice-water if properly applied.

The thousand and one unclean things used by our

patients on the recommendation of their over-zealous but ignorant friends, and which are accountable, as all oculists realize, for the irreparable loss of hundreds of injured eyes every year would be abandoned and forgotten if the merits of properly applied ice-water were thoroughly understood by the laity; and it has often occurred to me that the general practician, who comes so much more intimately and frequently in contact with his patients than the oculist, could by explicit directions instruct them on this subject and thus be the means of preventing an immense amount of suffering and the loss of many eyes.

DISCUSSION

Dr J. S. Carlton, Big Plain: I would like to ask Dr Clark how he obtains sterilized ice-water.

Dr Clark: That is a very pertinent question. I obtain that as nearly as I can by taking sterilized gauze patches and putting on lumps of ice, that is the manufactured ice. I understand by this process that I do not have absolute sterilized ice-water because the companies who manufacture ice sometimes use vaporization instead of distillation, but the water is approximately sterile. I then put the water into a dish which has been sterilized. The ice I do not attempt to vouch for.

THE OCULAR AND ORBITAL SYMPTOMS OF LESIONS OF THE FRONTAL SINUS

ROBERT SATTLER, M. D., CINCINNATI

Suggestions drawn from carefully conducted clinical studies, with the disclosures of surgical experience, have led to and clearly defined a rational and eminently practical surgery for these obscure lesions of the sinuses of the frontal bone.

The pathologic processes which invade these pneumatic cavities are better understood than formerly. The acute ones disclose their nature almost with certainty of diagnosis. The clinical characteristics and the indications for

surgical intervention, can only in exceptional instances be misinterpreted.

Chronic lesions are of far more frequent occurrence. Their course is almost without exception of interminable chronicity with clinical attendants so meager or uncertain that error in diagnosis is frequent. The reasons for this are evident. Those which result from transplantation of pyogenic products from the adjacent nasal canal, which are again among the most frequent, and those as well which are due to direct extension along the mucous lining or bony walls from intranasal disease along the connecting channel or frontal canal, occur with special frequency among male adults. These air-spaces have even during early adult life reached spacious dimensions and their bony encasement is fortified as age advances. The low grade of inflammatory activity which commonly attends such processes and the compensatory hypertrophy or sclerosis of the walls which is thereby excited, combine to decree for the incarceration of pyogenic matter—granulation-tissue, inspissated pus, etc.—an almost latent and uncertain clinical course.

These are among the causes why recognition of chronic lesions is well-nigh improbable during the early stages, at least until more tangible evidence of perforation of the outer wall with undermining of the periosteum and other symptoms point to their real nature. Again in consequence of the constant choking with granulation-tissue or other pathologic products the cavity is distended. Increasing rarification with atrophy of the bony walls as well as of the mucous lining results, accompanied by gradual and partial absorption or dessication of the contents.

A larger cavity with thinner walls completely shuts off all communication from the nasal cavity through the infundibulum or frontonasal canal, and causes such disturbance of its physiologic purpose as to occasion constant distress often accompanied by violent explosions of neuralgic

attacks over this locality. It may also happen that increase of thickness or hyperostosis of the external wall especially results as a final expression of a chronic lesion. Not infrequently is this attended by violent outbursts of neuralgic pain without local or inflammatory symptoms. In such cases, surgery which may suggest itself and be practiced as an empiric measure for diagnostic means or in search of pus, even in the absence of any positive sign of its presence, reveals only bone hypertrophy. Why this should cause in some cases violent suffering, and in others none, is as unexplained as the vagaries of other similar lesions of the temporal bone. We also meet with the same negative expression in other secondary lesions. The growth of osteophytes or exostoses within the enormously distended sinus affords only another illustration. With the exception of the increasing deformity, pain or other subjective symptoms of discomfort remain absent.

It has already been stated that it is during early and middle life that the original sinus lesion or the final expression of such a lesion is met with. The discovery of the real cause or character of such resulting or secondary lesion however is possible only after the surgical intervention, which becomes expedient or necessary, reveals it. This does not imply that lesions with a similar latent course are not met with also in the earlier years of life. Experience has taught me and especially my earlier observations that the cases of so-called periorbitis and unquestionably also a goodly share of the cases of caries of the margin of the orbit in strumous and rachitic children, are really expressions of frontal-sinus disease. The earlier stages of the disease are latent as in older subjects, but owing to the thinness of the bony inclosures and the small size of the cavity, perforation occurs more readily and almost as a necessary sequence.

The temporal angle of the sinus is not infrequently the location for perforation of the retained contents and a trail

of burrowing pus follows of a necessity the contour of the orbital margin, and its outlet or sinus eventually opens near the outer canthus. The location so far removed from the original starting point, is not at once associated with a sinus lesion. It is a disclosure of surgery and a noteworthy triumph as well, which has proved the truth of this statement, and has enabled us to treat these obstinate cases with far greater satisfaction and avoidance of unsightly deformity.

Some fifteen years ago I began a systematic and careful study of all cases belonging to this category. The first attempts at exploratory surgery in chronic cases with latent course, in which retention of pus or other inflammatory products was surmised, were made with old-fashioned drills and trephines.

Brief mention of one of the first cases is made because of its instructitve lesson. A lad aged twelve years had suffered for years from frontal headache. For some time his parents had noticed an increasing prominence of the region over the frontal sinuses, and near the upper margin of the orbit. Nasopharyngeal catarrh was present but there were no unusual features. The customary local treatment had been ineffectually tried for a long time without relief from the headaches. There was no tenderness over the frontal-sinus region, nor redness or swelling of the soft parts. Unmistakable bone enlargement however was present over this entire region. Ocular symptoms there were none, except epiphora which was neither persistent nor annoying. In spite of the negative symptoms the sinus was opened with a drill, which operation owing to the thickness of the skull was both difficult and tedious. Extensive hyperostosis was found and the sinus full of pus. Subsequently the other sinus was opened with similar disclosures. Recovery ensued with complete freedom from pain.

The point, which this brief recital emphasizes, is that

exploratory surgery, aided and reenforced by modern surgical methods and the use of less cumbersome instruments, affords us an opportunity for the practice of rational and successful treatment.

Taking up briefly the special purpose of this paper, the ocular and orbital symptoms of the more uncommon chronic lesions, it must again be stated that for an indefinite period such lesion or other final expressions may run an entirely latent course, both so far as local and constitutional disturbances are concerned.

Among the first tangible evidences are the diffused and localized tenderness without redness or swelling of the affected region. This is generally unilateral as it is rare to find both cavities affected at the same time. This gives way to transitory painful swelling of the periosteum and bone, often with redness and swelling of the overlying soft parts. These symptoms come and go lasting generally several days or weeks. Headache may now become general. At the same time there will be observed a characteristic indication, and this is a change in the contour of the inner, upper and in some cases even the inferior margin of the orbit. The asymmetry of this important part of the face, and the change in physiognomy which it entails, point with significance to an existing lesion. If tenderness on pressure or on percussion is present, it is even more suggestive of this view. The most careful rhinoscopic examination fails to disclose more than a chronic catarrhal process, which is known to have been present and to which also the symptoms due to the sinus complication are assigned. In some cases even the symptoms of an existing nasal lesion are in abeyance during the progress of the sinus lesion. If the grade of inflammatory activity remains low, it may happen that a chronic empyema may undergo partial absorption or inspissation and terminate in contraction of the cavity with increased thickening of the walls, in other words hyperostosis results. It may also happen at this stage or with the

presence of the symptoms referred to, that a spontaneous evacuation through the frontonasal canal into the nose effects in some cases temporary arrest, and in a few complete termination of the sinus lesion. In exceptional cases among those just mentioned, in which hyperostosis of the walls and recovery without external perforation take place, there come about as remote sequences neuralgic seizures* of extraordinary severity.

A more frequent result however is the yielding of the walls at one or another point. In children this is not infrequently the temporal angle of the sinus but with them and with adults it is more often the lateral or orbital wall at points near or above or even at a point below the inner canthus of the eye. The periorbita in this locality is firmly attached to the bone and is furthermore reenforced by the orbital fascia and medial ligament, and this explains the resistance which is offered to the burrowing pus. For this reason the dissecting trail is often deflected and pushes its destructive work lower down and its most frequent outlet is under and at the outer or temporal border of the tear-sac. Not infrequently several fistulous openings discharging the contents of the *sinus frontalis* appear along the orbital margin near its middle or even its outer division.

*This patient, a man aged 36, had suffered from what he and his phyiscian supposed were intense paroxysms of supraorbital neuralgia of the right side. Years ago he had contracted syphilis, but no manifestations of late syphilis were observed. Nevertheless he had received the most thorough antispecific treatment for several years. The entire frontal region near the margin of the orbit was thickened and was the seat of an extensive bone hypertrophy. This swelling was smooth except at the under surface near the free margin of the orbit where irregularities were discovered. He suffered constantly from pain with exacerbations of more violent character at short intervals. Drooping of the upper lid but neither exophthalmos or lateral displacement of the eye were present.

An exploratory incision disclosed most extensive thickening of the bone which was hard and brittle and not vascular. Several fistulous openings in the bone near the free upper margin of the orbit were discovered but there was no pus or offensive discharge. The sinus was freely opened. The cavity was small and partially filled with caseated pus. The entire region was ablated and recovery though tedious resulted with complete subsidence of the intense neuralgic seizures.

They may also undermine the periosteum of the tear-sac, erode the *os unguis* and superior maxillary of this region and without external perforation, discharge their contents into the nose. In particular do we observe this in broken-down syphilitics. In such cases both internal and external perforation is likely to take place.

THE OCULAR SYMPTOMS

The earliest ocular manifestations are observed in the eyelids. A serous infiltration of the loose cellular tissue of the roof of the orbit dependent upon and associated with transitory exacerbations of the insidious sinus lesion, may interfere with the action of the levator muscles of the upper lid, and also with the superior rectus muscle. Drooping of the upper lid and slight restriction of motion upwards is often noticed. Proptosis due to the same cause and lateral or downward displacement of the globe may also be present even at this early period. To these symptoms are added an edema of the inner third of the upper lid with dusky discoloration. This in some cases is so much like the inflammatory edema and tissue-infiltration which attends a suppurating chalazion, that it is not infrequently mistaken for this. On the part of the conjunctiva, especially the retrotarsal and ocular divisions, engorgement of the venous channels and frequently chemosis are observed. This is not of inflammatory origin but is due to obstruction to the outflow of the venous channels. In some cases the upper fornix at this point is evulsed and pus-trails may discharge their contents into the conjunctival sac.

The symptom of proptosis is a variable one, and is not in conspicuous evidence even in pronounced cases of uncomplicated frontal-sinus disease. In those cases in which a necrosing syphilitic lesion invades the ethmoidal cells and frontal sinus jointly, or all of the pneumatic cavities are involved, it is almost uniformly present.

A feature of the exopthalmos accompanying *sinus*

frontalis lesion deserves mention. In common with similar processes of the ethmoidal cells it is subject to great variation. At times it is present and again it disappears entirely. Only in exceptional cases, in which perforation under the periorbita takes place behind the *margo orbitalis* and insertion of the orbital fascia and medial ligament, and the dissecting trails push backwards towards the apex of the orbit, with dislocation of the eye as a necessary result, is exopthalmos a conspicuous symptom.

To this rather incomplete description of the clinical features a brief account of a typical case is added in order that it may supplement what may have been omitted.

The patient, a lad aged twelve, had for several months complained of general headache which did not yield to the treatment, general or local, which was faithfully tried. His parents were healthy, the boy well developed and free from any evidence which might suggest constitutional disease. Several weeks before he was brought to me he was taken to the family physician who attempted to open, what he supposed to be an ordinary hordeolum near the inner border of the upper lid. When he first came to me the asymmetry between the frontal regions of the two sides was unmistakable. The entire inner half of the right upper lid was infiltrated and the skin dusky in color. The movements were restricted and the palpebral fissure distorted and contracted. The superficial episcleral veins of the conjunctiva were tortuous and prominent. Proptosis with slight lateral displacement was present but there were neither diplopia nor restriction of ocular movements. Functional examination of the eye was perfect and nothing noteworthy was observed on opthalmoscopic examination.

The entire inner and upper margin of the right orbit was tender on palpation but redness was confined to the tissues of the lids. At a point under the tear-sac, which appeared more pronounced as compared with the other or healthy side, tenderness on the slightest pressure was com-

plained of. Over the sinus itself however it required much firmer pressure to excite pain. Fever and lassitude, which had steadily increased, were constant. Surgical intervention was practiced without delay. It brought unlooked-for revelations. The sinus was uncommonly roomy considering the age of the patient and was crowded with granulation-tissue and pus. On the under or orbital side, bone perforation had occurred in several places. The pericranium was extensively elevated and a large trail leading to and under the tear-sac and side of the nose which corresponded to the point of greatest tenderness was also discovered.

Recovery was tedious but unattended by complications. The surgical methods which enable us to explore the *sinus frontalis* from without for diagnosis and successful treatment, are at present so satisfactory that but few surgeons attempt drainage or exploration through the intranasal opening. I have long abandoned this method as an uncertain and unsatisfactory one and resort exclusively to the external one with chisel and mallet. Trephines and dental drills are preferred by some surgeons, but the simplicity of manipulation of the method and instruments referred to, justly entitle them in my opinion to preference.

THE IRIS IN THE OPERATION OF CATARACT EXTRACTION

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No single operative procedure in the domain of special surgery has been given so much thought and study as that for the extraction of senile lenticular cataract. It is gratifying to look back over the history of the operation and to see it come up, from the position of the questionable resort of *depressio cataractae* in the earliest history of surgery of the lens, to the dignity extraction now sustains as a safe

measure in this day of local anesthesia and aseptic surgery.

The importance of success in the operation is patent to everyone, for loss of the eye after cataract extraction is to the operator what loss of the patient is to the general surgeon. The factors which go to make up success comprise all the details of the operation. It is one that to the onlooker may seem exceedingly simple, but in which every step must be rightly taken to insure the successful issue.

While it would be interesting for us to enter upon a discussion of all the questions entering into the operation, it is our purpose to confine ourselves to those raised by a consideration of the part the iris plays in the operation and its immediate after-treatment. A broad interpretation of this subject might lead us unwittingly into practically all its phases. We shall however consider that it implies mainly consideration of (1) *Prolapsus iridis* and (2) Iritis.

The iris is the anterior prolongation of the middle tunic of the eye, the uveal tract,—the ciliary body forming the middle, and the choroid the posterior portions of this structure. Its peripheral border is attached to the inner surface of the eyeball at the sclerocorneal junction, and besides its anatomic connection with the ciliary body lying immediately behind this attachment, it receives on its anterior surface the prolongation of the fibers and endothelial investments of the pectinate ligament which we know is in turn formed by an extension and modification of the posterior limiting membrane of the cornea. This reflection of the pectinate ligament on to the iris leaves a space between the cornea and iris—the angle of the iris—which has much to do with the functional health of the eye. The total diameter of the iris is from 10 to 12 m. m.; its thickness, when the pupil is dilated, 0.4 m. m., the pupil varying greatly according to light and health and usually appearing about 4 m. m. The iris does not stand in an exactly vertical plane, its central or pupillary portion being advanced by the lens on whose anterior capsule its pos-

terior surface rests. It thus divides the aqueous chamber into a large anterior and a small posterior chamber. The aqueous itself is secreted by the ciliary body and to a certain extent the posterior surface of the iris, by its continuous formation maintaining an intraocular pressure equal to the force of a column of mercury 26 m. m. in height.

When the cornea is perforated and the aqueous escapes the lens and iris come forward so that the iris rests against the posterior surface of the cornea. The section through which the lens is to be extracted must be located near the periphery of the cornea so that when it is completed we find the iris as a curtain between the opening thus made and the lens. If the escape of the aqueous is rapid the force of the fluid has a tendency to carry the iris into the wound. Whether to remove a section of this curtain by an iridectomy or to allow the lens as it escapes to stretch the iris tissue before it until it escapes through the free pupillary border which it has carried up to or through the corneal section, is a question which has been studied most carefully by ophthalmologists in recent years, and it may be said that this is the only important point in connection with the operation on which there is not practical unanimity of opinion.

The objections to the simple operation, as marshalled by those not practicing it, are:

(1) It necessitates a larger corneal incision.

(2). Section must be made rapidly to avoid wounding the iris, making it difficult to obtain an even curve as desired.

(3) The capsulotomy is not so easily made.

(4) Greater pressure and more skillful and delicate manipulation are necessary to expel the lens.

(5) Prolapse of the iris is apt to occur and may be found after the most faultless operation.

(6) Posterior synechia are more frequent.

(7) Secondary operation—discission—must be resorted to more frequently than after the combined operation.

Other asserted objections are that the simple extraction is more difficult to perform (?)—disposes to inflammatory reaction more than the combined, and that frequently there are present conditions which render it inapplicable.

In the earliest extractions iridectomy had only been performed when there was some special indication for it. When von Graefe, in the hope of getting a section located where there would be less liability of suppuration, introduced the method of peripheral linear extraction, this section, owing to its location, made incarceration of the iris quite sure to result so that of necessity iridectomy was made a part of the operation. Later on a virtue was made of this necessity and iridectomy which, in glaucoma and recurrent iritis, had been demonstrated to be a most opportune measure, was now said in extraction of cataract in eyes otherwise perfectly normal to afford greater protection against inflammatory reaction, to facilitate opening of the capsule and removal of the cortical remains of the cataract.

Antisepsis however has taught many new lessons in regard to extraction. Through it we know that suppuration of the flap is due, not to the breaking down of a poorly nourished tissue but to infection, and that with antiseptic precautions there is no more reason to anticipate suppuration of a wound in corneal tissue than one placed in the more vascular tissues in the scleral margin. In fact suppuration always means an infected wound. With this discovery operators were again able to bring the section forward into the cornea and could disregard the question of suppuration.

From a study of the relations of the aqueous chamber, both in its normal condition and where a section has been

made, it can be seen that the tendency to prolapse is greatest the more peripheral the section. On the other hand if we bring the section too far forward into the corneal tissue we may increase the amount of astigmatism and make easy the production of adhesions of the iris to the angles of the wound. It would seem that a section located just at the limbus ought to be attended with the minimum amount of danger of prolapse and of adhesions, and to our mind the ideal incision is one in which the puncture and counter-puncture are made fairly within the limits of the limbus, and in which the knife in completing the section emerges in the corneal tissue just at its edge. This section should comprise not less than two-fifths of the corneal circumference and where there is a large lens or nucleus should be even more extensive.

A candid study must convince one that the trend in present ophthalmic surgery is toward the simple operation in uncomplicated cases. Those who now resort to iridectomy as a routine measure have narrowed the excision of the iris down to a small coloboma, and many have come to the position that unless the case presents unusual features or something arises during the operation to render it advisable, it is best to entirely omit the iridectomy. The evidence of a large number of cases among various surgeons is necessary to enable us to form a proper estimate of their relative merits.

These statistics have been carefully collected and a comparison of the results obtained by the leading men by either method show that cataract operation is successful, *i. e.*, V.=1-10 or better, in 93%; the result is fair, *i. e.*,V. = less than 1-10 in 4%, and absolute failure is to be expected from 2% to 3%.

Schweigger's tables, published in 1891, in which

V=1-6 instead of V=1-10 is taken as the standard of success, gave for the simple operation (450 cases)

Success	76.5
Secondary operation	19.1
Failure	4.4

and for combined operation (371 cases)

Success	75.5
Secondary cataract	19.2
Loss	5.7

Marshall's statistics for the Royal London Ophthalmic Hospital from 1880 to 1893, quoted by Coleman, give

Success—simple operation	91.97
Success—Iridectomy	89.81
Success—Preliminary iridectomy	87.29

A number of conditions predispose to iritis and prolapse of the iris through the corneal wound, and where any of these are present, we have to consider not only the operation from the standpoint of lens extraction, but also from that of dealing with an organ in which there will be a tendency towards unfavorable sequels. In the eye the history of former attacks of iritis, the presence of posterior synechia, high tension, rigidity of the iris as evidenced by its failure to dilate after the instillation of cocain, immaturity of cataract, or pain in connection with its formation, fluid vitreous, or loss of an eye from inflammatory trouble in a former extraction, afford conditions in which simple extraction probably does not form the most conservative method of procedure. So too, bronchitis, asthma, a tendency for spasmodic action of the eye-muscles especially of the orbicularis, or an unusual prominence of the eye from a large amount of orbital tissue,—the latter a condition of increased extraocular tension,—or any pathologic condition of the body which might make inflammatory reaction probable after an operation, should cause us to consider the combined method, or even in some

cases to resort to a preliminary iridectomy. Where complications are not recognized before the time of operation the method should be to proceed as in a simple extraction, and if at any stage during the performance developments arise which indicate a probability of prolapse of the iris, escape of vitreous, or inability to complete the operation as a simple one without an undue amount of manipulation, an iridectomy can then be resorted to and the combined operation thus made.

The thorough evacuation of all cortical substance is one of the necessary safeguards against iritis; likewise the manner of opening the capsule bears its relation to this sequel. Free laceration of the anterior capsule in several directions over the pupillary area undoubtedly does in some cases remove the membrane entire and perhaps makes unnecessary the performance of a discission later, but undoubtedly it also tends to the production of more numerous posterior synechia, and we agree with those operators who advise the simple linear capsulotomy near the equator of the lens. This reduces to a minimum the contact of capsular tags with the posterior surface of the iris and thus guards against slight forms of inflammation, and the secondary operation can be performed later if necessary on account of thickening or wrinkling of the capsule.

Eserin has, for a number of years, been used quite extensively, a drop or two of a weakened solution being instilled into the eye at the completion of the operation. It was supposed to aid in the prevention of prolapse. Since this may occur at any time after the operation up to the closing of the wound and the myotic effect of the eserin is transient, we do not see how it can be regarded as a safeguard of much importance. It has been known to produce more or less inflammation of the iris even in unoperated eyes, and the use of this drug for the purpose of preventing prolapse is being discarded.

Other measures to prevent prolapse may be men-

tioned as follows: Performance of the operation with the patient on the bed where he is to be during the healing process; the gentle and uniform pressure of proper dressings, both eyes being covered; the protection of the eyes by a mask or screen; and quiet on the part of the patient. He should rest quietly in bed for the first three days after the operation, not being confined however to a position on his back entirely, but allowed to lie on the side of the unoperated eye, or, if there is too much restlessness, even allowed to sit up. Where simple extraction has been performed, the eye should be inspected in from 24 to 36 hours. If prolapse has occurred at this time a sufficient amount of tissue can be excised to make a typical iridectomy, and usually this can be done very satisfactorily under cocain, the final result being practically as if it had been performed at the time of the original operation. When the prolapse occurs later there is usually an agglutination of the iris to the lips of the wound and it will be impossible to replace the iris and restore the pupil to its normal position and shape. In such cases it is best to snip off the protruding iris, or, if not too large in amount, to allow the wound to heal and nature to strangulate the hernia thus formed. This prolapse may be expected to occur in from 8 to 12% of the cases, but good vision is usually secured in these cases notwithstanding the accident. Probably between 90 and 95% of the cases in which prolapse occurs will afford good vision. The unfavorable sequels may be cystoid cicatrix, iritis, cyclitis, misplaced pupil, irregular astigmatism and glaucoma.

Iritis is one of the sequels of cataract extraction with which every operator has to deal. Ordinarily this inflammation is slight and does no harm beyond the production of a few posterior synechia. Here it may be regarded as purely traumatic and due to the traction upon and bruising of the iris in the operation. Knapp speaks of the formation of synechia in these cases as a mechanic agglutination

of two raw surfaces, as in the extraction of the lens within its capsule it never occurs, and where there is a peripheric capsulotomy they are limited entirely to the region of the capsular wound. The presence of cortical material in the aqueous chamber after operation, or of a number of capsular tags, predisposes to this inflammation. Any imperfection of the aseptic technic likewise favors its production. Where operation is performed on an eye that had been the seat of a former iritis or iridocyclitis the inflammation may be considered as the lighting up of an old trouble.

Practically all operators as a routine measure instill a few drops of atropin solution, beginning the second or third day after the operation and keeping up the same until all evidences of the inflammatory tendency are past.

It is but a slight step from the simple traumatic disturbance of the iris to true iritis, and iridocyclitis is only an extension of the graver forms of iritis. It is one of the most unfortunate sequels of the operation and fortunately is very rare. This inflammation should be actively treated. In plethoric patients of robust constitution, and especially where there is reason to believe that traumatism has played a part in the inflammation, ice-cold applications can be used if the evidences of iritis present themselves within the first two or three days after the operation. In patients whose physical condition is below par, in aged people, and where the inflammation develops at a later date, hot fomentations or leeches are indicated. Aperients and remedies to meet any general condition which may have predisposed towards iritis should be used. Atropin should be always and freely used, high-tension being its only contraindication. Iritis may thus greatly prolong the recovery of the case and produce thickening and wrinkling of the capsule, making a secondary operation necessary, but the eventual result will be good. In iridocyclitis the plastic exudate will more probably lead to distortion and closure of the pupil and even possibly degenerative changes in the

vitreous, detachment of the retina and shrinking of the globe. If these latter changes have taken place, an iridectomy or iridocystotomy may later restore useful vision. In many cases where it seems as if the eye would be lost by inflammatory action, patient continuance of the treatment and the observance of quiet and rest on the part of the patient will succeed in quieting the inflammation and the preservation of useful vision.

Taking the ordinary run of cases as they present themselves to the surgeon it is probable that in from 15 to 20% he will find complications or conditions which will induce him to resort to the combined method of operating. They will probably furnish us a larger number of cases of inflammation of the iris. We know where there is a tendency to recurrent inflammation of the iris or to glaucoma, iridectomy has a salutary effect upon the organ. In such cases as these it is undoubtedly wise to make the iridectomy as a preliminary operation, extraction being performed at a later date. We should remember however that the operation of iridectomy itself is one of considerable importance and its steps should be performed in a way that gives the greatest guarantee against inflammation. The peripheral linear section introduced by von Graefe, and as practised by him, was probably a perfectly safe one, but we know that in the hands of other operators, with the associated iridectomy, it was not infrequently attended with iridocyclitis. Where there is high tension it is well to place the section well back and to make the iridectomy broad and clean, but in other cases the section may be well forward in the limbus, or in the margin of the transparent corneal tissue and the iridectomy narrow, the blades of the scissors being held at right angles to the section, the coloboma thus made being a narrow one. Iridectomy is not an infallible safeguard against incarceration of the iris in the lips of the wound. After its performance all shreds of iris tissue should be carefully replaced in the aqueous chamber

and by inspection we should assure ourselves that the sphincter is perfectly regular and the shoulders of the coloboma even. Notwithstanding these precautions, we find occasionally incarceration of the edges of the iris in the angles of the wound and the same sequels which follow prolapse will be found following the iridectomy under these circumstances. Thus Kerschbaumer, in a report of 200 extractions with iridectomy, gives 13 cases of incarceration of the iris, that is, 6½%, and out of these 13 cases, 7 had cyclitis with damaging results. Taking the personal equation of the operators as the same, it would seem that incarceration in extractions with iridectomy is apt to be attended with more disastrous effects than prolapse in simple extraction. It would seem to us that some operators who have dilated upon the evil effects of prolapse have not set forward with sufficient prominence the untoward effects which may sometimes attend even the ideally executed iridectomy. Where the patient is restless there is a possibility of an accident in connection with its performance, as traumatic iridodialysis. The ill effects of a too peripheral section and badly performed iridectomy are most serious, and doubtless every cataract operator would rather have several cases of prolapse in simple extraction than one of these cases of iridocyclitis and cystoid cicatrix which have been known to follow the combined operation.

Our conclusions are that in uncomplicated senile cataract iridectomy is not an antiphlogistic measure *per se*, and the simple operation with its less mutilation and natural pupil is no more liable to be followed by iritic inflammation than the combined extraction. It will be found applicable in about 80% of the cases presenting themselves and in these constitutes the safest and best method of operating. The preliminary, or combined operation, should be reserved for cases in which complications are present, or are to be feared.

Chapter VII—Obstetrics

THE PREVENTION OF INFECTION DURING AND AFTER LABOR

WILLIAM H. TAYLOR, M. D., CINCINNATI

To medical men who attend society meetings, this subject may seem so commonplace as not to justify the waste of time consumed in its consideration, yet careful investigation reveals the fact, that the reduction of mortality from sepsis following parturition in private practice has been far less than in hospital service. Dr Cullingworth recently President of the British Medical Association, made the startling statement that from 1881 to 1897 the number of deaths and the ratio of deaths from this cause had been in excess of previous years, and Dr E. J. Wilson, after extensive investigation, said, "In the past decade there has been accomplished almost nothing toward abating this disease in private practice," and beside the actual mortality, it must be borne in mind that the effects of sepsis are not limited to those who die, but that in many who escape with life, months or years of invalidism may result from an infection during abortion or delivery at full term.

Precedent to further consideration, is a proper answer to the question, "What is meant by puerperal infection?" Recent investigations show conclusively that it is not a disease dependent upon one specific cause, it is not necessarily due to the invasion of staphylococci, but may also be caused by a number of other microorganisms. Rosenberg has recently said: "The bacteria of putrefaction cause undoubtedly many cases of puerperal sepsis," and as tending to a proper understanding of the morbid processes, it were well to abandon the old term "puerperal fever," because it im-

plies a specific disease, and adopt the expression "puerperal sepsis" or "infection," which conveys a correct idea of the genesis of the disease under consideration, and to understand that these names are simply a convenient term signifying the effects of various infections which have entered the organism by way of puerperal genitalia.

The sources of these poisons may be as various as are the character of germs. It is probably universally recognized that what are commonly called contagious diseases may give rise to puerperal sepsis, but further we should proclaim emphatically, that pus and sloughing tissues, discharges from nose and ear and decayed teeth, and germs emanating from morbid processes in inferior animals may be the determining cause of infection of the puerperal woman.

My topic implies the possibility of preventing puerperal sepsis, and no advance in the science of medicine in recent times affords as much satisfaction as the assurance that we can prevent sepsis in its various forms. While with this purpose in view much attention has properly been given to the purification of the physician and the patient, I am sure the environment of the patient has not been sufficiently considered.

The germs of disease are ubiquitous, and it is well established that the virulence of some of the microbes varies greatly with conditions of soil, temperature, air and sunlight, and it is a fact that must be remembered, that it is not always the pure cultivation that manifests most virulence. The health and vigor of the individual are all-important in relation to infective processes, and it is a matter of constant observation that such diseases are especially severe and fatal to those who live in the midst of filthy surroundings. Noxious gases are evolved wherever animal and vegetable decomposition is taking place. The constant breathing of these gases may so lower the vitality as to increase the vulnerability to infections of all kinds. Decomposing matter at-

tracts flies and other insects which may become the carriers of infectious matter to our patients.

A stagnant atmosphere or one loaded with foul matter may so depress a woman that she is susceptible to malign influences which she would successfully resist if she were stronger, hence it is of great importance that the habitation of the prospective parturient should be made as pure as practicable.

We all know that the defective action of any of the excretory organs results in accumulation in the blood of matters which impair vitality and healthy activity, rendering the subject much more susceptible to morbid influences. This being true it is a necessary deduction that we should prepare our obstetric patient for her ordeal by securing healthy activity of all her functions, by frequent bathing and free action of the bowels and kidneys.

The majority of practicians have learned the value of antiseptic surgery and seek to practice it, but rigid antisepsis is much more difficult in obstetric work. Surgical operations are usually brief and the operator devotes his entire time to the operation, and is not liable to contamination during its progress. An obstetric case continues many hours, the location of the patient may change repeatedly, and the attendant, not being constantly engaged at the bedside, is exposed to many sources of surgical impurity. For these reasons the antiseptic technic cannot be so perfectly observed. Nevertheless these difficulties are no excuse for carelessness, and the physician is under as great obligation to try to prevent infection in obstetric practice as he is in surgery, and he should insist upon as exact compliance with antiseptic precaution and discipline on the part of himself, the nurse and the patient, as if he were doing an important surgical operation.

Difference of opinion exists as to what is necessary preparation of the patient when labor begins. My own hospital requirements are a thorough bath, an entire change of

clothing, free evacuation of the bowels, and antiseptic cleansing of the external genitals, but for several years I have prohibited the vaginal douche in normal labors. It has been well established that the vaginal mucous membrane ordinarily does not contain pathogenic germs, but that the secretion possesses to a decided degree an inhibitory control over pathogenic bacterial development. The secretion which possesses this power is acid in its reaction from the presence of lactic acid. When we find such mucus present, as can be demonstrated by litmus test paper, there is no need of artificial disinfection.

We should insist upon recently laundried sheets, towels and binders, absorbent cotton or clean muslin to be burned immediately after being used, and allow no sponges. Dr Matthews Duncan spoke of antiseptic precautions as "transcendental cleanliness."

The character of the labor has much influence over the development of sepsis. Prolonged labor makes the application of antisepsis more difficult. The exhaustion from long-continued pain, loss of sleep, muscular effort, mental depression and bleeding all make the system more vulnerable. To mitigate the ill effects of these, I administer chloral hydrate during the earlier part of the labor and chloroform in the latter part.

The experiments of Morisini showed that colon bacilli had no pathogenic effect on the uninjured uterine mucosa, but in every case of irritated endometrium their introduction was followed by death in from 14 to 52 hours. Such condition of irritation always exists after delivery, and prolonged labor favors septic development, consequently aids to delivery may be demanded. My rule is to expedite delivery (usually by forceps) when the temperature and pulse begin to rise.

When labor is completed I seek to secure firm contraction of the uterus, not only to prevent hemorrhage, but also because a well-contracted uterus does not permit accu-

mulation of material in its cavity, and diminishes the chances of absorption of septic matters. Immediately after the woman is cleansed, I have a pad of gauze and absorbent cotton sprinkled with creolin or bichlorid, applied to the external parts, to be continued as long as the woman is in bed. I do not allow vaginal douches after normal delivery. All cleansing after delivery must be done with antiseptic solutions. If it is necessary to use a catheter I have the vulva cleaned before its introduction. I use a new gum catheter which has been immersed in an antiseptic solution, and I never use the same catheter on a second case; if there are abrasions about the vulva I apply a dusting-powder of equal parts of boric acid and acetanilid.

When the patient gives any evidence of exhaustion, or I have any reason to fear sepsis, I give quinin grs. iii every three or four hours.

DISCUSSION

Dr E. Gustav Zinke, Cincinnati: The paper of our distinguished friend, Dr Taylor, is certainly in every aspect a very important one, and I simply rise to offer my testimony in substantiation of every word that he has said, and take the liberty to add a word or two. One of the principal causes of puerperal septicemia in private practice is the fact that pregnant women do not as a rule consult a physician until the time of labor has arrived. Many times when they do consult a physician, not enough attention is paid to certain particulars by him. He neglects to determine the position of the child; the capacity of the mother's pelvis; the general physical condition of the patient; her surroundings at home and many times there is a total disregard of all antiseptic precautions.

It is easy to see how, with any of these points neglected, the way to septicemia is paved. He alone is a safe obstetrician who learns to know all about his patient and gives her the benefit of all that there is known in the art of midwifery. When we consider the results of obstetric operations, where nothing or little is known as to the presentation of the child and its position; when nothing is known as to the mother's pelvis, its shape and size; when all necessary precautions have been discarded or neglected, sepsis is one of the com-

plaints that follow. Operative interferences, such as introduction of the hand or the forceps, made under such conditions are as a rule untimely, prolonged, and I dare say, unskillful.

It is true there are many complications which may arise during pregnancy, labor and confinement, predisposing to sepsis, for which the physician is neither responsible nor is he always able to prevent them; and the latter is all the more true if he was not consulted in due time.

This too is the reason why the mortality from sepsis in obstetric and other hospitals is so much less than that in private practice. I have looked over the records of the Cincinnati Hospitals, public and private, of the last four years; and they show, most conclusively, that the mortality rate from septic causes in private practice is astonishingly large, notwithstanding that the existence of sepsis, the actual cause of death, is suppressed in many cases for very obvious reasons; while in hospital practice, especially public hospitals, where the real cause of death is usually freely stated and septic conditions more or less prevail, the mortality from septicemia is surprisingly low.

For this reason I have for some time contended, or at least advised, that when people are so situated that they can not readily receive the benefit of that which science has given us, they should place themselves under the care of a hospital, especially a lying-in-hospital, and I do honestly believe that as we are growing richer in experience and are willing to do the best for our patients, we will urge women to avail themselves of the hospital-opportunities for the purpose of confinement, just as they do now for other operations.

Dr F. F. Lawrence, Columbus: A word as to whether or not the popular idea among the laymen and the profession that antisepsis cannot possibly be had outside of the hospital has not a great deal to do with the hospital practice in obsterics. The idea that they must have this, that and the other thing pervades the public mind. The consequence is that in obstetric cases you will frequently find an old piece of carpet, or a quilt which has been laid away in the attic for a month brought out for service, and if you suggest that it is filled with danger to the patient they will think you are a crank. If you suggest the idea beforehand that they must have things absolutely clean they will say "Why, doctor,

everything about me is clean," and if they refrain from saying it they will think it. If you tell them that it is now necessary that they boil a certain number of towels, and that they should boil a certain amount of clothing to use, you can have them practising asepsis, and you can have them practice this at home just as well as in a hospital.

Now one point more, and that is this—the fact that you may have infection during or after labor does not always mean an acute infection which is immediately fatal, a septic peritonitis or puerperal fever so called. We may have infection which subsequently gets well with very little trouble.

If you will watch the history of your case carefully you will find that a very large percentage of pus-tubes and pelvic abscesses are the result of infection in and after labor and criminal abortions, and that not all of these cases are of gonorrheal origin. A large percent will follow unclean criminal work which is not antiseptic. That point I simply wish to emphasize.

I believe that it is within the hands of every practician to reduce this death-rate from infection just as low in his private practice in the home as it is possible in any hospital in the state.

Dr Frank Warner, Columbus: I should like to say a word or two on this subject in connection with a ruptured perineum or a ruptured cervix. I do not believe in the promiscuous washing out of the vagina in all cases of confinement But I do believe that a great many of these cases become infected because of not looking after a ruptured perineum, or a cervix that is only slightly torn.

I believe that in all these cases we should carefully investigate. If we find the cervix only slightly torn we should treat it then and there as a surgical wound and stitch it up. And we should not be content with merely stitching it up and applying a surgical dressing only that one time, but should follow it up and treat it as we should any other surgical wound which is open to infection. Then if we employ washings frequently enough so that in case infection does come we can counteract it, I believe that we should have a great many less cases of septic infection.

In reference to infection that has actually occurred after sewing up the perineum, I believe that it would be best to cut the stitches immediately and thus give exit to infective germs, and treat the wound antiseptically. If we have a

ruptured cervix, we should employ daily washings. In that way I believe that we shall also prevent a great many cases of septic infection. As Dr Taylor has indicated, aseptic carefulness is a prime factor in preventing septic infection.

Dr J. P. Sawyer, Cleveland: The intelligent employment of surgical cleanliness need not be a matter of great difficulty in a community of ordinary intelligent people. I saw in a French journal that certain French physicians had recommended beside the ordinary methods of cleanliness as regards their hands and other procedures the practice of wearing rubber gloves. These delicate rubber gloves are of great value in surgical operations and they do not interfere with the delicate touch which may be necessary in performing many operations. The gloves can be taken fresh from an antiseptic solution, and they give a comfortable feeling of security to the physician that he is not with his finger carrying infection into the vagina.

In many cases of obstetric work it is very difficult to obtain well-trained nurses. In many cases they are positively ignorant; they are well-meaning, but untrained, and through ignorance have carried infection into the vagina. It might not be an unwise procedure to see that in everything that they do about the genitalia that they not only make a practice of the ordinary scrubbing and washing, but that they use rubber gloves which have been taken from antiseptic solutions.

Dr W. H. Taylor, closing: I do not use the vaginal douche after normal labor, but have the parts cleansed as soon as possible after delivery. Then I apply such a dressing as has been mentioned on which I sprinkle boric acid and acetanilid. I have such applications kept constantly to the parts until the patient is out of bed. I agree with the gentleman as to the closing of all wounds of the perineum. I do not however believe that it is wise ordinarily to stitch up lacerations of the cervix immediately after labor without there is some special reason for it. If there is reason to believe that the laceration of the perineum after it has been united is not doing well certainly the best course is to cut the sutures and open the wound. Where I have reason to fear sepsis from a long-continued labor I usually administer quinin in three-grain doses every three hours until the danger is passed.

Chapter VIII—Membership and Delegates

PERMANENT MEMBERS
OF THE OHIO STATE MEDICAL SOCIETY

CAPITALIZED: Life members.

Local Secretaries will please notify the Secretary of errors or omissions, and forward obituary notices with their annual catalogues.

Abbott, C. N., Academy of Medicine.....Cincinnati, 1892
Adams, P. N., Montgomery Co. Medical Society.....Dayton, 1885
Adair, Samuel G., Washington Co. Medical Society.....Beverly, 1893
Albl, Michael A., Cuyahoga Co. Medical Society.....Cleveland, 1892
Albers, John G.....Fulda, 1898
Albright, Charles W.....Milo, 1898
Alcorn, E. G., Gallia Co. Medical Society.....Gallipolis, 1895
Alcorn, John B., Gallia Co. Medical Society.....Gallipolis, 1894
Aldrich, Chas. J., Cuyahoga Co. Medical Society.....Cleveland, 1891
Aldrich, Daniel B., Ashtabula Co. Medical Society.....Ashtabula, 1892
Allard, Lorenzo D., Pike County Medical Society.....Portsmouth, 1894
Allen, C. O.....Logan, 1895
Allen, Dudley P., Cuyahoga Co. Medical Society.....Cleveland, 1885
Allen, George M., Academy of Medicine.....Cincinnati, 1892
Allen, S. E., Academy of Medicine.....Cincinnati, 1892
Anderson, L. C.....Greenville, 1898
Andre, Orrin C., Hempstead Memorial Academy of Med..Waverly, 1888
Armentrout, Lyman W.....Mt. Vernon, 1892
Axline, Chas. Z., Hildreth District Med. Society.....Fultonham, 1884
Ayres, S. C., Academy of Medicine.....Cincinnati, 1877
Backus, L. C., Tri-State Medical Society.....Fayette, 1895
Bain, Frank D., Northwestern Ohio Medical Ass'n.....Kenton, 1885
Baker, A. R., Cuyahoga Co. Medical Society.....Cleveland, 1886
Baker, J. P., Hancock Co. Medical Society.....Findlay, 1891
Baker, William O., N. E. O. M. A.....Louisville, 1882
Baker, E. W.....Clyde, 1898
Baldwin, J. F., Academy of Medicine.....Columbus, 1875

Ballinger, J. B.....Webster, 1880
Barker, Fred D.....Dayton, 1898
Barnhill, J. U., Academy of Medicine.....Columbus, 1884
Barrere, D. M., Montgomery Co. Medical Society.....Dayton, 1884
Barton, Robt. S., Tuscarawas Co. Medical Society.....Baltic, 1898
Bates, F. L., Allen Co. Medical Society.....Lima, 1890
Battles, Mary M., Ashtabula, Lake and Geauga Co. M. S., Ashtabula, 1897
Bauer, M. M., N. E. O. M. A.....Lake, 1884
BEACH, J. N., Central Ohio M. S., Madison Co.....Jefferson, 1854
Beardsley, C. E., N. W. O. M. A.....Ottawa, 1869
Beck, John S., Montgomery Co. Medical Society.....Dayton, 1879
Beckwith, Seth W., Toledo Medical Association.....Toledo, 1892
Beers, A. M., Tuscarawas Co. Medical Society.....Newcomerstown, 1882
Beery, George O.....Lancaster, 1899
Bell, R. L., Clarke Co. Medical Society.....Springfield, 1899
Belt, John H., Cleveland Medical Society.....Cleveland, 1897
Belt, R. C., Miami Valley Medical Society.....Milford, 1892
Bennett, C. A., Clermont Co. Medical Society.....Withamsville, 1892
Bennett, W. C., Morrow Co.....Mt. Gilead, 1892
Bertolette, Harry B., Wayne Co. Medical Society.....Shreve, 1896
Bessey, J. Mortimer, Toledo Medical Association.....Toledo, 1887
Bethauser, C. M., Academy of Medicine.....Columbus, 1895
Bevington, H. S., Crawford Co. Medical Society...Sulphur Springs, 1892
Bigham, J. G., Holmes Co.....Millersburg, 1897
Binder, Albert, Northwestern Ohio Medical Ass'n.....Ottoville, 1899
Bird, Edw. H., N. W. O. M. A.....Dupont, 1892
Bivans, W. A., Brown Co. Medical Society.....New Hope, 1892
Black, Albert P.....Bradner, 1899
Blackburn, M. E., Academy of Medicine.....Columbus, 1895
Blair, B. H., Warren Co. Medical Society.....Lebanon, 1892
Blake, F. W., Academy of Medicine.....Columbus, 1892
Blake, Wm. H., Central Ohio Medical Society.....Shadeville, 1878
Bland, J., Crawford Co. Medical Society.....Bucyrus, 1892
Blankenhorn, H., U. M. A. N. E. O.....Orrville. 1895
Blazer, H. E., Eastern Ohio Medical Ass'n.....Salineville, 1897
Bleile, A. M., Academy of Medicine.....Columbus, 1882
Blickensderfer, Jos., Tuscarawas Co. M. S.....New Philadelphia, 1897
Bliss, C. B., Clarke Co. Medical Society.....Springfield, 1899
Bodman, Lewis H., Toledo Medical Association.....Toledo, 1892
Boerstler, Geo. W.....Lancaster, 1870
Bohl, John, Sr., Washington Co. Medical Society.....Watertown, 1892
Boggess E. M.....Washington C. H., 1892
Bond, John W., Toledo Medical Association.....Toledo, 1892

Bonifield, C. L., Academy of Medicine.....Cincinnati, 1892
Bonner, C. A., Montgomery Co. Medical Society.....Dayton, 1892
Bonner, Horace, Montgomery Co. Medical Society.....Dayton, 1890
Boone, D. W., Belmont Co. Medical Society.....Bellaire, 1890
Boone, Jos. S., Belmont Co. Medical Society.....Powhattan Point, 1892
Bown, H. H., Guernsey Co. Medical Society.....Pleasant City, 1899
Boyd, James P., N. E. O. M. A.....Akron, 1892
Bradford, W. N.....Cambridge, 1896
Brady, M. B., Academy of Medicine.....Cincinnati, 1892
Brand, Walter W., Toledo Medical Ass'n.....Toledo, 1896
Brannan, T. H., Tuscarawas Co. Medical Society.....Canal Dover, 1884
Brayton, Asa, N. W. O. M. A.....Carey, 1892
Brent, C. P., Academy of Medicine.....Cincinnati, 1892
Brigham, O. S., Toledo Medical Association.....Toledo, 1892
BRINKERHOFF, D. H., Sandusky Co. M. S.....Fremont, 1853
Brockett, A. J., Cleveland Medical Society.....Cleveland, 1874
Brown, E. O. S., Pike Co. Medical Society.....Beaver, 1895
Brown, H. M., Academy of Medicine.....Cincinnati, 1882
Brown, J. A. .....Germantown, 1886
Brown, J. E., Academy of Medicine.....Columbus, 1892
Brown, R. A.....Circleville, 1896
Bruehl, Gust., Academy of Medicine.....Cincinnati, 1892
Brundage, L. A., Greene Co. Medical Society.....Xenia, 1892
Bruner, Wm. E., Cleveland Medical Society.....Cleveland, 1897
Brush, Edmund C., Hildreth District M. S.....Zanesville, 1878
Buckingham, John M., Clarke Co. Medical Society.....Springfield, 1885
BUCKNER, J. H., Academy of Medicine.....Cincinnati, 1863
Buechner W. L., Mahoning Co. Medical Society.....Youngstown, 1879
Bunn, Jas. W., Adams Co. Medical Society.....West Union, 1872
Bunts, Frank E., Cleveland Medical Society.....Cleveland, 1892
Burnham, R. D., Erie Co.....State Soldiers' Home, Sandusky, 1898
Burrows, S. S., Ashtabula Co. Medical Society.....Geneva, 1895
Butler, Geo. W.....Columbus, 1869
Buttemiller, J. C., Academy of Medicine.....Cincinnati, 1897
Caldwell, John L., Pike Co. Medical Society.....Waverly, 1894
Caldwell, J. S., Academy of Medicine.....Cincinnati, 1892
Calhoun, W. M., Union M. A. Columbus.....East Liverpool, 1892
Callinan, D. F.....Corning, 1892
Campbell, Oscar B., Cleveland Medical Society.....Cleveland, 1892
Carpenter, E. G., Cleveland Medical Society.....Columbus, 1892
Carpenter, Julia W., Academy of Medicine.....Cincinnati, 1879
Carrick, Anthony L., Academy of Medicine.....Cincinnati, 1871
Carson, Archibald I., Academy of Medicine.....Cincinnati, 1892

Carson, Frank D., Holmes Co. Medical Society.....Benton, 1892
Case, Freeman D., Ashtabula Co. Medical Society.....Ashtabula, 1886
Chadwick, Leroy S., Cuyahoga Co. Medical Society.....Cleveland, 1892
Chamberlin, Chas. S.....Kinsman, 1892
Chaney, S. F., Highland Co.....Pricetown, 1898
Chapman, Byron, N. E. O. M. A.....Copley, 1885
Chapman, Geo. L.....Toledo, 1899
Chapman, Wm. C., Toledo Medical Ass'n.....Toledo, 1875
Chesney, John A., Crawford Co. Medical Society.....Bucyrus, 1892
Chidester, C. W.....Delaware, 1895
Chisholm, H., Marion Co. Medical Society.....Marion, 1895
Church, Walter F., Sandusky Co. M. S.....Gibsonburg, 1897
Clapp, Harold T., Cleveland Medical Society.....Cleveland, 1891
Clark, C. F., Academy of Medicine.....Columbus, 1885
Clarke, Ida, Mahoning Co. Medical Society.....Youngstown, 1889
Clark, Frank S., Cleveland Medical Society.....Cleveland, 1892
CLARK, JOHN H., Champaign Co. M. S.....Mechanicsburg, 1869
Clark, Myron S., Mahoning Co. Medical Society.....Youngstown, 1879
Clay, W. P.....Elgin, 1896
Clemson, G. W., Perry Co. Medical Society.....Thornville, 1896
Clouse, Geo. M., Academy of Medicine.....Columbus, 1892
Coates, B. O., Cleveland Medical Society.....Cleveland, 1898
Coldham, Wm. W., Toledo Medical Ass'n.....Toledo, 1892
Cole, A. P., Ross Co. Medical Society.....Chillicothe, 1895
Cole, Wm. U., Academy of Medicine.....Columbus, 1896
Coleman, N. R., Academy of Medicine.....Columbus, 1875
Coleman, Warren, Miami Co. Medical Society.....Troy, 1899
Collamore, Geo. A., Toledo Medical Ass'n.....Toledo, 1880
Collins, Edgar F.....Mt. Sterling, 1896
Collins, Milton H., Clarke Co. M. S.....South Charleston, 1890
Colville, George H., Belmont Co.....Circleville, 1887
Colville, Robert W.....Mt. Vernon, 1899
Combs, John S., Clermont Co. Medical Society.....Owensville, 1892
Conard, George R., Clinton Co. M. S.....New Vienna, 1890
Conklin, W. J., Montgomery Co. Medical Society.....Dayton, 1868
Cone, J. E., Mahoning Co. Medical Society.....Youngstown, 1889
CONNER, PHINEAS S., Academy of Medicine.....Cincinnati, 1868
Cook, G. F., Butler Co. Medical Society.....Oxford, 1885
Cook, J. E., Cleveland Medical Society.....Cleveland, 1895
Cooper, Albert, Central Ohio Medical Society.....Columbus, 1881
Cooperrider, C. A., Academy of Medicine.....Columbus, 1892
Cope, E. C., Belmont Co. Medical Society.....Barton, 1895
Corbin, Lee, Montgomery Co. Medical Society.....Dayton, 1892

Corlett, Wm. T., Cleveland Medical Society.....Cleveland, 1882
Corson, O. M., Butler Co. Medical Society.....Middletown, 1879
COTTON, J. D., Washington Co. Medical Society.....Marietta, 1852
Courtright, D. W., Pickaway Co.....Circleville, 1898
COURTRIGHT, GEO. S.....Lithopolis, 1867
Courtright, T. E.....Kirkersville, 1899
Cowan, F., N. C. O. Medical Society.....Ashland, 1896
Cowell, Willard M.....Columbus, 1898
Cox, J. M., Ross Co. Medical Society.....South Salem, 1877
Crane, A. M., Marion Co. Medical Society.....Marion, 1881
Craver, S. Belle, Toledo Medical Ass'n.....Toledo, 1892
Crawford, A. J.....Gloucester, 1896
Crile, Geo. W., Cleveland Medical Society.....Cleveland, 1892
Crossland, Jeff. C., Muskingum Co. M. S.....Zanesville, 1890
Crump, A. A., Jr., Holmes Co. M. S.....Millersburg, 1892
Culbertson, Louis Rogers.....Zanesville, 1896
Cushing, Edward F., Cuyahoga Co. M. S.....Cleveland, 1892
CUSHING, H. K., Cuyahoga Co. M. S.....Cleveland, 1857
Dandridge, N. P., Academy of Medicine.....Cincinnati, 1871
Darrah, Jos. Wilson.....Martin's Ferry, 1897
Davidson, N. P., Union Co. Medical Society.....Hilliards, 1890
Davison, John F., Northern Ohio M. S.....North Amherst, 1893
Davisson, J. Alexander, Preble Co. M. S.....Dayton, 1896
Davis, Ben., Clarke Co. Medical Society.....New Carlisle, 1895
Davis, Gilman R., Lawrence Co. Medical Society.....Ironton, 1896
De La Barre, Paul.....Port Clinton, 1892
Death, H. J., Warren Co. Medical Society.....Franklin, 1892
Denman, Wm. C., Marion Co. Medical Society.....Marion, 1882
Deuschle, W. D., Academy of Medicine.....Columbus, 1885
DeVilbiss, Allen, Toledo Medical Association.....Toledo, 1887
Dick, W. L., Academy of Medicine.....Columbus, 1892
Dickey, Thos. A., Butler Co. Medical Society.....Middletown, 1879
Dine, C. L., N. W. O. M. A.....Minster, 1893
Dixon, M. T., Academy of Medicine.....Columbus, 1895
Dolina, J. F., Montgomery Co. Medical Society.....Dayton, 1892
Donnelly, James, Toledo Medical Ass'n.....Toledo, 1892
Dorman, H. W., Ashtabula Co. Medical Society.....Ashtabula, 1886
Dorsey, Jos F.....Dresden, 1894
Downs, Samuel .....Waterville, 1876
Driscoll, Park B., Champaign Co. M. S.....Rosewood, 1899
Dugan, John P., Clarke Co. Medical Society.....Springfield, 1899
Duncan, A. M., Crawford Co. Medical Society.....Bucyrus, 1886
Duncan, James A., Toledo Medical Association.....Toledo, 1874

Dunham, J. M., Academy of Medicine.....Columbus, 1895
Dunham, W. H., Academy of Medicine.....Cincinnati, 1892
Dunlap, C. O.....McArthur, 1881
Dutton, C. F., Cuyahoga Co. Medical Society.....Cleveland, 1880
Eakins, Jehu, Gallia Co. Medical Society.....Patriot, 1894
Eddy, Chas. W., Washington Co. Medical Society.....Marietta, 1888
Edwards, R. C.....W. Carlisle, 1895
Eichberg, Jos., Academy of Medicine.....Cincinnati, 1882
Ellis, Samuel B., Montgomery Co. M. S.....Dayton, 1897
Ely, J. S., Belmont Co. Medical Society.....Barnesville, 1892
Emerick, E. J., Central Ohio Medical Society.....Columbus, 1895
Emmons, D. R., Champaign Co. M. S.....N. Lewisburg, 1895
Erwin, N. B., Sandusky Co. Medical Society.....Gibsonburg, 1891
Erwin, J. J., Cleveland Medical Society.....Cleveland, 1898
Esch, Jos. P., Erie Co. Medical Society.....Huron, 1892
Evans, A. E., Central Ohio Medical Society.....Columbus, 1882
Evans, Otho, Warren Co. Medical Society.....Franklin, 1892
Evans, Geo. B., Montgomery Co. M. S.....Dayton, 1892
Everts, Orpheus, Academy of Medicine.....Cincinnati, 1885
Faber, Chas. A., Toledo Medical Ass'n.....Toledo, 1892
Farnsworth, G. B., Cleveland Medical Society.....Cleveland, 1895
Fassig, J. M., Muskingum Co. Medical Society.....Zanesville, 1893
Faucett, R. C., Union Medical Ass'n of Columbiana....N. Jackson, 1896
Fauster, John U., North-western Ohio Med. Ass'n.....Paulding, 1899
Feil, G. V., Cleveland Medical Society.....Cleveland, 1897
Fels, Geo. W., Academy of Medicine.....Cincinnati, 1892
Finley, Mary Jordan, Academy of Medicine.....Mansfield, 1897
Fisher, A. W., Toledo Medical Ass'n.....Toledo, 1892
Fisher, W. H., Toledo Medical Ass'n.....Toledo, 1892
Fisher, P. .....Cincinnati, 1892
Fitzpatrick, T. V., Academy of Medicine.....Cincinnati, 1890
Fitzsimmons, J. F., Crawford Co. M. S.....Bucyrus, 1892
Flemming, J. C. .....Carlisle, 1892
Floyd, J. C. M., Jefferson Co. Medical Society.....Steubenville, 1884
Foertmeyer, C. H., Academy of Medicine.....Cincinnati, 1892
Foltz, Tobias H., N. W. O. M. A.....Lima, 1892
Formorin, J. L., Clermont Co. Medical Society.....Marathon, 1892
Foshay, P. M., Cleveland Medical Society.....Cleveland, 1893
Foster, G. F., Ross Co. Medical Society.....Kingston Centre, 1882
Fowler, Silas W. .....Delaware, 1873
Fox, J. F., Tuscarawas Co. M. S.....New Philadelphia, 1895
Fox, Curtis L., Ashtabula Co. Medical Society.....Kingsville, 1897
Fraker, H. C., Academy of Medicine.....Columbus, 1895

Francis, A. W., Brown Co. Medical Society.....Ripley, 1892
Fraser, J. M., Cuyahoga Co. Medical Society.....Cleveland, 1892
Fraunfelter, J., N. E. O. M. A.....Canton, 1886
French, Jas. M., Academy of Medicine.....Cincinnati, 1892
FULLER, S. W.....Bellefontaine, 1853
Fullerton, Erskine B., Academy of Medicine.....Columbus, 1894
Gage, Rawson S., Washington Co. M. S.....Qualey, 1892
Gahm, J. L., Hempstead Academy of Medicine.....Jackson, 1895
Gaither, Alfred, Cincinnati Academy of Medicine.....Cincinnati, 1899
Gale, Geo. T., Washington Co. M. S.....Newport, 1888
Gardiner, W. G., N. W. O. M. A.....Toledo, 1892
Gehritt, T. M., N. W. O. M. A.....Deshler, 1892
Geyer, Jos. L., Muskingum Co. M. S.....Norwich, 1892
Gibbon, H. B., N. W. O. M. A.....Tiffin, 1891
Gillette, Wm. J., Toledo Medical Ass'n.....Toledo, 1892
Gilliam, D. Tod, Academy of Medicine.....Columbus, 1873
Gilliam, Earl M. .....Columbus, 1890
Glenn, W. W., Highland Co. Medical Society.....Hillsboro, 1895
Goebel, Anna M., Allen Co. Medical Society.....Lima, 1892
Goetz, F. E., Cleveland Medical Society.....Cleveland, 1892
Goodhue, Geo., Montgomery Co. Medical Society.....Dayton, 1884
Goode, B. P., Academy of Medicine.....Cincinnati, 1892
Gordon, Patrick A. .....Junction City, 1894
GORDON, T. W., Brown Co. Medical Society.....Georgetown, 1849
Gores, F. C., Academy of Medicine.....Cincinnati, 1892
Goss C. W. .....Lancaster, 1895
Goss, J. H., Central Ohio Medical Society.....Lancaster, 1884
Gotwald, D. K., Clarke Co. Medical Society.....Springfield, 1899
Graefe, Wm., Erie Co. Medical Society.....Sandusky, 1874
Graefe, Chas., Erie Co. Medical Society.....Sandusky, 1891
Granger, Francis M., Highland Co. M. S.....Russell, 1881
Gray, C. G., Lawrence Co. Medical Society.....Ironton, 1896
Gray, Francis C., Montgomery Co. M. S.....Dayton, 1894
Green, Henry S., Morrow Co.....Cardington, 1878
Green, Jos. H., Miami Co. Medical Society.....Troy, 1899
Greene, D. W., Montgomery Co. Medical Society.....Dayton, 1882
Griffis, F. C.....Mt. Gilead, 1896
Grimm, Adolph, Academy of Medicine.....Cincinnati, 1892
Groves, J. E., Tuscarawas Co. Medical Society.....Urichsville, 1884
Guerin, Z. F., Central Ohio Medical Society.....Columbus, 1884
Guiss, W. H., Crawford Co. Medical Society.....Tiro, 1895
Gutermuth, W. C. .....Versailles, 1899
Halderman, S. S., Hempstead Med. Academy.....Portsmouth, 1896

Hall, E. V. .....Convoy, 1898
Hall, Joe A., Miami Co. Medical Society.....Troy, 1899
Hall, Rufus B., Academy of Medicine.....Cincinnati, 1884
Hall, Willard A., Ross Co. Medical Society.....Chillicothe, 1896
Hamann, C. A., Cleveland Medical Society.....Cleveland, 1895
Hamer, W. W., American Medical Association.....Bellefontaine, 1895
Hamilton, W. D., Academy of Medicine.....Columbus, 1886
Hamilton, L. D., Marion Co. Medical Society.....Marion, 1896
Hamilton, C. S., Academy of Medicine.....Columbus, 1891
Haney, Josiah C.....Dalton, 1896
Hanson, D. S., Cleveland Medical Society.....Cleveland, 1898
Hardy, Irene .....Massillon, 1897
HARMON, JULIAN .....Warren, 1857
Harper, E. A. .....Columbus, 1896
Harris E. C., Clarke Co. Medical Society.....Springfield, 1899
Harris, J. H. .....Clifton, 1899
Harrison, E. B., N. W. O. M. A.....Napoleon, 1869
HART, B. F., Washington Co. M. S.....Marietta, 1854
Hart, C. S. .....Marietta, 1895
Hart, Romeyn B. Jr., Washington Co. M. S.....Marietta, 1892
Hart, Samuel, Washington Co. M. S.....Marietta, 1887
Hartman, Geo. W., N. W. O. M. A.....Wauseon, 1887
Hartman, S. D., Miami Co. Medical Society.....Tippecanoe City, 1874
Hasencamp, Oscar, Toledo Medical Ass'n.....Toledo, 1891
Hathaway, Harrison, Toledo Medical Ass'n.....East Toledo, 1874
Hatch, Chas. A. .....Newark, 1893
Hawley, Edwin P., Cuyahoga Co. Medical Society.....Cleveland, 1892
Hayes, J. D., Perry Co. Medical Society.....Somerset, 1895
Haynes, J. T., Erie Co. Medical Society.....Sandusky, 1893
Haynes, J. Purcell, Toledo Medical Ass'n.....Toledo, 1892
Hayward, E. T. .....Waterford, 1896
Heady, James F., Academy of Medicine.....Glendale, 1899
Heaton, Townsend, Academy of Medicine.....Aberdeen, 1892
Heffner, G. W. .....Circleville, 1895
Heiter, Carl, Erie Co. Medical Society.....Sandusky, 1875
Hendershot, B. C., Tuscarawas Co. M. S.....New Philadelphia, 1897
HENDERSON, D. W. .....Marysville, 1856
Henderson, Robert, Champaign Co. M. S.....Urbana, 1892
Henderson, Geo. W., N. W. O. M. A.....West Cairo, 1892
Henderson, L. .....Marysville, 1899
Henderson, G. .....Marysville, 1899
Hendley, F. W., Academy of Medicine.....Cincinnati, 1892
Henry, A. G., N. W. O. M. A.....North Baltimore, 1892

HENDRIXSON, HUGH, Academy of Medicine.....Columbus, 1868
HERRICK, H. J., Cleveland Medical Society.....Cleveland, 1868
Herrick, H. B., Cleveland Medical Society.....Cleveland, 1895
Hersh, E. G., Hancock Co. Medical Society.....McComb, 1892
Heston, Jos. Z. .....Columbus, 1898
Hewetson, H. L., Tuscarawas Co. Medical Society....Urichsville, 1895
Hewetson, Alex. H., Belmont Co.....St. Clairsville, 1894
Hiestand, E. B., N. W. O. M. A.....Kenton, 1884
Hillbish, Fred S. .....Fremont, 1878
Hill, Frank E. .....Cincinnati, 1892
Hill, Wm. W., Wood Co. Medical Society.....Weston, 1892
Hillkowitz, Wm., Academy of Medicine.....Cincinnati, 1892
Hines, J. Arthur .....Van Wert, 1879
Hiner, S. B., Allen Co. Medical Society.....Lima, 1874
Hobbs, Wilbert A., Union Co. Medical Society.....East Liverpool, 1889
Hobson, John A., Belmont Co. Medical Society.....Flushing, 1891
Hobson, J. F., Cleveland Medical Society.....Cleveland, 1897
Hoege, G. L., N. W. O. M. A.....Fostoria, 1895
Hoeltge, A. E., Academy of Medicine.....Cincinnati, 1892
Hoff, Jos. W., Meigs Co Medical Society.....Pomeroy, 1872
Holcomb, Calvin B., Perry Co.....Corning, 1898
Holdren, G. W. .....Bloomingburg, 1892
Holliday, W. W., Cuyahoga Co. Medical Society.....Cleveland, 1892
Holliday, Benj. W., Cuyahoga Co. Medical Society.....Cleveland, 1875
Hollister, Geo. A. .....Toledo, 1897
Holman, A. W. .....Circleville, 1895
Holmes, C. R., Academy of Medicine.....Cincinnati, 1892
Holston, J. G. F., Muskingum Co. M. S.....Zanesville, 1892
Homes, W. W. .....Columbus, 1895
Hoover, C. F., Cleveland Medical Society.....Cleveland, 1896
Hoover, Collins M., Union Medical Society.....Alliance, 1885
Hoover, Thos. C., Academy of Medicine.....Columbus, 1891
Hoppe, H. H., Academy of Medicine.....Cincinnati, 1892
Hottendorf, Louis P., Academy of Medicine.....Cincinnati, 1892
Hough, C. A., Warren Co. Medical Society.....Lebanon, 1890
Hough, Wayland S., Summit Co. M. S.....Cuyahoga Falls, 1875
Hous, Geo. W., Montgomery Co. Medical Society.....Clayton, 1892
House, L. F., Highland Co. Medical Society.....Sinking Spring, 1899
House, A. F., Cleveland Medical Society.....Cleveland, 1880
House, Chas. F. .....Painesville, 1897
Howard, W. T., Cleveland Medical Society.....Cleveland, 1895
Howard, A. B., Cleveland Medical Society.....Cuyahoga Falls, 1897
Howell, J. Morton .....Dayton, 1892

Howells, James Owen, Belmont Co.....Bridgeport, 1897
Hubbard, Thomas, Toledo Medical Ass'n.....Toledo, 1889
Hudson, J. F., N. E. O. M. A.....Canton, 1892
Hughes, E. E.....Oak Hill, 1895
Hughes, F. M. .....Sandusky, 1892
Hughes, D. E. .....Delaware, 1895
Hughey, J. W. .....Washington C. H., 1892
Hulick, John W., Clarke Co.....Springfield, 1898
Hulin, O. W., Union Medical Ass'n of N. E. O.....Greenford, 1895
Humiston, Wm. H., Cleveland Medical Society.....Cleveland, 1880
Humphrey, W. H., Greene Co. Medical Society....Yellow Springs, 1899
Humphreys, C. H., Montgomery Co. Medical Society.....Dayton, 1892
Hunt, A. H. .....Wooster, 1892
Hurd, A., Hancock Co. Medical Society.....Findlay, 1870
Hussèy, M. F., Shelby Co. Medical Society.....Sidney, 1892
Huston, W. O. .....Bellaire, 1894
Hutchings, S. R., Clarke Co. Medical Society.....Springfield, 1899
Ikirt, G. P., Champaign Co.....East Liverpool, 1882
Ingersoll, J. M., Cleveland Medical Society.....Cleveland, 1897
Ireland, W. E. .....Washington C. H., 1887
Ireland, S. A. .....Washington C. H., 1892
Ireton, E. C. .....Marathon, 1892
Irvin, John W., Ashland Co.....Magnetic Springs, 1896
Jackson, Thos. W.....Akron, 1895
Jacobs, Harold H., N. E. O. M. A.....Akron, 1892
Jacobs, W. C. .....Akron, 1892
James, A. D.....Mt. Gilead, 1892
James, W. S., Cleveland Medical Society.....Cleveland, 1897
Jamison, J. Ross, Wayne Co.....Apple Creek, 1898
Jenkins, M. J., Central Ohio Medical Society.....Plain City, 1895
Jenks, Wm. O., Cuyahoga Co.....Nottingham, 1892
Jenner, Henry G., Montgomery Co. Medical Society.....Dayton, 1897
JENNINGS, ELLIS, Montgomery Co. M. S.....Dayton, 1867
Jennings, Gainor, Miami Co. Medical Society.....West Milton, 1892
Jewett, H. S., Montgomery Co. Medical Society.....Dayton, 1871
Johnson, Fred L. .....Worthington, 1897
Johnson, Alice M., Central Ohio M. S.....Columbus, 1895
Johnstone, A. W., Academy of Medicine.....Cincinnati, 1899
Jones, H. S. .....Columbus, 1895
Jones, Wm. A. .....Toledo, 1892
Jones, L. M., Greene Co Medical Society.....Jamestown, 1892
Jones, J. D., Cuyahoga Co. Medical Society.....Cleveland, 1870
JONES, R. E., N. W. O. M. A.....Gomer, 1863

JONES, T. W. .....Columbus, 1847
Joseph, Leopold, Academy of Medicine.....Cincinnati, 1892
Judkins, Wm., Academy of Medicine.....Cincinnati, 1892
Judkins, C. P., Academy of Medicine.....Cincinnati, 1887
Judy, C. S., Montgomery Co. M. S.....Miamisburg, 1896
Junkerman, Geo. S., Academy of Medicine.....Cincinnati, 1892
Kaestlen, Samuel E., Cleveland M. S.....Cleveland, 1892
Kahler, J. Frank, Guernsey Co.....Quaker City, 1898
Kahn, L., Academy of Medicine.....Columbus, 1895
Kammann, Albert A., Academy of Medicine.....Cincinnati, 1892
Kautz, J. W., Brown Co. Medical Society.....Arnheim, 1892
KAY, ISAAC, Clarke Co. Medical Society.....Springfield, 1853
Kay, C. H., Clarke Co. Medical Society.....Springfield, 1899
Keck, Peter A., Academy of Medicine.....Cincinnati, 1892
Keller, B. T. .....Bloomingburg, 1891
Keller, Thos. F., N. W. O. M. S.....Tiffin, 1887
Kemp, Lucia, Crawford Co. Medical Society.....Bucyrus, 1892
Kendig, Elias V., Ashland Co. Medical Society.....Hayesville, 1874
Kerns, J. F. Walpole, E. O. M. S.....Bellaire, 1892
Keycraft, Albert J. .....Fostoria, 1898
Kiely, W. E., Academy of Medicine.....Cincinnati, 1892
Kiester, W. H. .....Arcanum, 1899
Kimmell, J. A., Hancock Co. Medical Society.....Findlay, 1892
King, John I., Marion Co. Medical Society.....Martel, 1884
King, J. R., Academy of Medicine.....Cincinnati, 1892
King, W. L. .....Granville, 1899
Kinnison, U. L., Jackson Co Medical Society.....Jackson, 1899
KINSMAN, D. N., Academy of Medicine.....Columbus, 1864
Kirkley, Cyrus A., Toledo Medical Ass'n.....Toledo, 1874
Kitchen, Francis A., Toledo Medical Ass'n.....Toledo, 1892
Kline, P. J., Hempstead Academy of Medicine.....Portsmouth, 1895
Knapp, C. C. .....Zanesville, 1899
Knowlton, W. A., Cleveland Medical Society.....Cleveland, 1892
Koehler, Max, Academy of Medicine.....Cincinnati, 1893
Kofron, Jos. V., Cleveland Medical Society.....Cleveland, 1898
Kolb, Matthew G., Cleveland Medical Society.....Cleveland, 1892
Krause, B., Cuyahoga Co. Medical Society.....Cleveland, 1880
Krause, L. S., Montgomery Co. Medical Society....W. Carrollton, 1892
Krieger, Gustave L.....Madisonville, 1884
Krouse, Louis J., Academy of Medicine.....Cincinnati, 1892
Lambright, S., Miami Valley Medical Society.....South Lebanon, 1899
Landman, Otto, Toledo Medical Ass'n.....Toledo, 1892
LANGDON, C. P., Central Ohio Medical Society.....Columbus, 1851

Langdon, F. W., Academy of Medicine.....Cincinnati, 1892
Larimore, F. C., N. C. O. M. S.....Mt. Vernon, 1871
Lash, Josiah W., Ross Co. Medical Society.....Chillicothe, 1879
Lathrop, Arthur B., N. W. O. M. A.....Swanton, 1887
Lawless, James T., Toledo Medical Association.....Toledo, 1887
Lawrence, F. F., Academy of Medicine.....Columbus, 1888
Lawrence, J. C., Academy of Medicine.....Columbus, 1895
Leach, Robert .....Mt. Sterling, 1898
Leach, Sherman .....Columbus, 1888
Leahy, Maurice .....Tiffin, 1891
Lee, James F. .....Mt. Vernon, 1898
Lee, M. F.....Columbus, 1899
Lehman, C. W., Preble Co. Medical Society.....Eaton, 1895
Lenhart, Charles M. .....Zanesville, 1894
Leonard, E. L. .....Democracy, 1897
LEONARD, B. B., N. O. M. A.....West Liberty, 1854
Lerch, A. V. .....Pleasantville, 1898
Leslie, J. M., Ross Co. Medical Society.....Chillicothe, 1878
Lewis, Robert C. M.....Centerburg, 1898
Lewis, W. C., Fairfield Co.....Rushville, 1869
Lewis, H. A., N. W. O. M. A.....Continental, 1899
Lichliter, David C., Montgomery Co. Medical Society.....Dayton, 1892
Lightner, S. B., Clinton Co. Medical Society.....Sabina, 1888
Lincoln, William, Cleveland Medical Society.....Cleveland, 1896
Linden, W. E., Cleveland Medical Society.....Brooklyn, O., 1897
Lindenberger, L. M., Miami Co.....Troy, 1898
Lindsay, J. A., E. O. M. S.....Salineville, 1895
Link, Jos. A., Clarke Co. Medical Society.....Springfield, 1899
Longsworth, M. J. .....St. Mary's, 1897
Lorimer, Hugh F.....Fair Haven, 1898
Love, Ephraim W., Brown Co. M. S.....Fayetteville, 1892
LOVING, STARLING, Academy of Medicine.....Columbus, 1858
Lower, Wm. E., Cleveland Medical Society.....Cleveland, 1896
Lowman, J. H., Cleveland Medical Society.....Cleveland, 1877
Lowny, O. F., Guernsey Co. Medical Society.....Cambridge, 1899
Lowry, Jos. W., Lawrence Co. Medical Society.....Ironton, 1896
Loyer, Albert E. .....New Washington, 1898
Lucas, V. C., Cleveland Medical Society.....Cleveland, 1892
Lucas, A. O. .....New Washington, 1899
Lusk, S. B., Marion Co. Medical Society.....Waynesfield, 1895
Lyle, Benjamin F., Academy of Medicine.....Cincinnati, 1892
LYMAN, C. N., N. E. O. M. A.....Wadsworth, 1852
McCallum, D. D. .....Crestline, 1899

McClain, Jesse ..... Coshocton, 1899
McClellan, J. S., Belmont Co. Medical Society..... Bellaire, 1894
McClung, John C., N. W. O. M. A..... Leipsic, 1887
McCLURE, JAMES, Washington Co. M. S..... Marietta, 1866
McCollum, E. J., N. W. O. M. A..... Tiffin, 1871
McCoy, Clem. D., N. W. O. M. A..... Kenton, 1892
McCready, S. R., Union Medical Society..... Leetonia, 1898
McCullough, Jos. A..... Steubenville, 1894
McCullough, A. H., Academy of Medicine..... Mansfield, 1897
McCurdy, John, Mahoning Co. M. S..... Youngstown, 1870
McDougal, John G., Hildreth District M. A..... New Lexington, 1894
McGavran, Samuel B..... Cadiz, 1887
McGee, John B., Cleveland Medical Society..... Cleveland, 1880
McIntire, Wm., Central Ohio Medical Society..... Warrensburg, 1881
McKecknie, Josiah B., Clinton Co. Medical Society..... Cincinnati, 1892
McKee, Edward S., Academy of Medicine..... Cincinnati, 1886
McKim, F. E. ..... Marietta, 1893
McKinley, E. Burris, N. W. O. M. A..... Vaughnsville, 1887
McMurray, A. B. ..... Marion, 1879
McQuaide, Thos. L., Guernsey Co..... Cambridge, 1894
McVety, A. F., Lucas Co. Medical Society..... Toledo, 1895
Mackenzie, J. C., Academy of Medicine..... Cincinnati, 1892
Macready, James, Butler Co. Medical Society..... Monroe, 1885
Maerker, A. E. H., N. W. O. M. A..... Napoleon, 1892
Malsbary, Geo. E., Academy of Medicine..... Cincinnati, 1897
March, E. J., Stark Co. Academy..... Canton, 1898
Markley, Lee, Brown Co. Medical Society..... Georgetown, 1892
Marquart, Oscar M., Greene Co. Medical Society..... Osborn, 1891
Marris, Joseph ..... Columbus Grove, 1892
Marsh, F. O., Academy of Medicine..... Cincinnati, 1892
Marshal, R. J., E. O. M. S..... East Liverpool, 1897
Marshall, G. M., Hempstead Academy of Medicine..... Columbus, 1895
Marshall, W. C., Montgomery Co. M. S..... Dayton, 1892
Martin, Jas., N. E. O. M. A..... Fredericksburg, 1892
Martin, Thos. C., Cleveland Medical Society..... Cleveland, 1897
Matthias, A. C., N. W. O. M. A..... McComb, 1892
Mattoon, F. N., Madison Co..... Plain City, 1881
May, John B. ..... New Holland, 1892
Maynard, O. T., Cleveland Medical Society..... Elyria, 1892
Means, Chas. S., Academy of Medicine..... Columbus, 1896
Means, W. J., Central Ohio M. S..... Columbus, 1892
Melick, Wm. A., Muskingum Co. M. S..... Zanesville, 1892
Merriman, D. J. ..... Painesville, 1884

Merriam, E. D., Ashtabula Co. M. S.....Conneaut, 1884
Messenger, A. C., Greene Co. M. S.....Xenia, 1896
Metzler, Abraham S., Holmes Co. Medical Society.....Baltic, 1874
Miller, A. T., Tuscarawas Co. Medical Society.....Shanesville, 1890
Miller, Delbert J., Union Co. M. S.....N. Benton, 1892
Miller, John F., Shelby Co. Medical Society.....Port Jefferson, 1892
Miller, N. C. .....Fostoria, 1898
Miller, T. Clarke, N. E. O. M. A.....Massillon, 1893
Milliken, B. L., Cleveland Medical Society.....Cleveland, 1885
Millikin, Dan., Butler Co. Medical Society.....Hamilton, 1879
Mills, C. H., N. W. O. M. S.....Toledo, 1888
Mills, Charles D. .....Marysville, 1898
Mills, J. T., Central Ohio Medical Society.....Columbus, 1878
Mitchell, E. W., Academy of Medicine.....Cincinnati, 1892
Mitchell, Geo., Academy of Medicine.....Mansfield, 1897
Moody, Price, Morgan Co.....Triadelphia, 1898
Moody, Milo M., Union Co. M. S.....Chatham, 1892
Moore, C. A. .....Cambridge, 1894
Moore, D. L., Academy of Medicine.....Columbus, 1895
Moore, H. M. W., Academy of Medicine.....Columbus, 1894
Moore, Lyman G. .....Kinsman, 1878
Morgan, J. F., Hempstead Academy of Medicine.....Jackson, 1895
Morgan, R. J., N. W. O. M. A.....Van Wert, 1895
Morehouse, G. W.....Sparta, 1890
Morris, Joseph, N. W. O. M. A.....Columbus Grove, 1879
Mory, J. J.....St. Henry's 1871
Mosgrove, S. M., Champaign Co. M. S.....Urbana, 1884
MOUNTS, J. L., Warren Co. Medical Society.....Morrow, 1860
Mundhenk, L. R., Preble Co. Medical Society....West Alexandria, 1899
Murbach, Andrew J., N. W. O. M. A.....Archbald, 1874
MURPHY, JOHN A., Academy of Medicine.....Cincinnati, 1872
Murphy, John W., Academy of Medicine.....Cincinnati, 1892
Murray, Langdon S., N. E. O. M. A.....Medina, 1870
Myers, Noah, Clarke Co. Medical Society.....Springfield, 1892
Myers, I. A., N. C. O. M. S.....Shelby, 1892
Myers, J. E., Clarke Co. Medical Society.....Springfield, 1892
NASH, E. KING, Summit Co.....Montrose, 1876
Nash, W. H. H., Academy of Medicine.....Columbus, 1898
NEIL, ALEXANDER .....Columbus, 1868
Newton, C. W. .....Toledo, 1895
Niles, L. E. .....Springfield, 1896
Nincehelser, O. A., Champaign Co. M. S.....Mechanicsburg, 1899
Noble, N. T. .....St. Mary's 1892

Noble, Herbert E., N. W. O. M. A.....Toledo, 1892
Noble, Chas. D. .....Oberlin, 1893
Norris, Thos. B., Franklin Co.....Alton, 1882
North, John, Toledo Medical Ass'n.....Toledo, 1891
Nungesser, J. J., Cleveland Medical Society.....Cleveland, 1895
Oblitz, N. .....Columbus, 1895
Oglesbee, Wm. E., Warren Co. M. S.....Waynesville, 1892
Ohlmacher, A. P., Cleveland Medical Society.....Gallipolis, 1895
Oliver, J. C., Academy of Medicine.....Cincinnati, 1892
Oster, L. W., Cleveland Medical Society.....Cleveland, 1892
Overly, John E., C. O. M. S.....Columbus, 1888
Palmer, Chauncey D., Academy of Medicine.....Cincinnati, 1871
Parker, E. W. .....Gallipolis, 1899
Parry, John R., Belmont Co.....Woodsfield, 1898
PATTERSON, A. V. .....Mansfield, 1861
PEARCE, ENOCH .....Steubenville, 1859
Pennell, W. W. .....Fredericktown, 1884
Perkins, D. S., Cleveland Medical Society.....Cleveland, 1897
Peskind, Arnold, Cleveland Medical Society.....Cleveland, 1892
Peter, Robert, Tuscarawas Co. M. S.....Toledo, 1891
Petitt, Richard R., Montgomery Co. M. S.....Dayton, 1885
Phillips, W. S., N. W. O. M. S.....Columbus, 1895
Piper, Wm., Belmont Co. Medical Society.....Bellaire, 1892
Platter, Herbert M., Academy of Medicine.....Columbus, 1898
Plummer, Frank E. .....Coalton, 1896
Pomeroy, Frank S., Cleveland Medical Society.....Chardon, 1897
Porter, W. D., Academy of Medicine.....Cincinnati, 1892
Potter, S. B. .....Fredericktown, 1892
Powell, Wm. S. .....Defiance, 1881
Pratt, L. C. .....Bellefontaine, 1895
Price, H. H., Guernsey Co. Medical Society.....Cambridge, 1899
Probst, C. O., C. O. M. S.....Columbus, 1892
Pugh, Frank H., N. W. O. M. A.....Bryan, 1892
Pumphrey, R. J., Belmont Co. Medical Society.....Massillon, 1895
Quirk, Howard W., Cleveland Medical Society.....Cleveland, 1889
Quinn, Allen T., Clinton Co. Medical Society.....Wilmington, 1881
Rambo, Cyrus M., Muskingum Co. M. S.....Zanesville, 1894
Ramsey, W. T., Guernsey Co. Medical Society.....Cambridge, 1899
Ranchous, Walter E. N.....Columbus, 1898
Rank, W. C. .....Newark, 1895
Rankin, Theodore W., Academy of Medicine.....Columbus, 1881
Ransohoff, Joseph, Academy of Medicine.....Cincinnati, 1879
Rardin, Joseph S. .....Portsmouth, 1892

Ravogli, Augustus, Academy of Medicine.....Cincinnati, 1892
Ray, J. B., Pike Co. Medical Society.....Omega, 1896
Ray, James B., Hempstead Medical Academy.....Portsmouth, 1898
Ray, J. H., S. O. A. of M.....Coalton, 1895
Rea, E. H., E. O. M. S.....Ironville, 1897
REAMY, THAD A., Academy of Medicine.....Cincinnati, 1855
Reason, J. W. .....Hilliards, 1899
Redrow, I., Batavia Co. Medical Society.....Williamsburg, 1895
Reed, Calvin H., Toledo Medical Ass'n.....Toledo, 1873
Reed, Chas. A. L., Academy of Medicine.....Cincinnati, 1881
Reed, T. J. .....Massillon, 1881
Reemelin, R. H., Academy of Medicine.....Cincinnati, 1892
REEVE, J. C., Montgomery Co. M. S.....Dayton, 1861
Reeve, J. C., Jr., Montgomery Co. M. S.....Dayton, 1892
Reif, Chas. F. .....Fremont, 1892
Reinhart, James C., Toledo Medical Ass'n.....Toledo, 1887
Reynolds, R. D.....Kelleys Island, 1897
Rheinfrank, J. H., N. W. O. M. A.....Perrysburg, 1886
Rheinfrank, W. H. .....Perrysburg, 1895
Rhu, August, Marion Co. Medical Society.....Marion, 1886
Richards, A., Perry Co. Medical Society.....New Lexington, 1895
Richardson, Alonzo B., Academy of Medicine.....Massillon, 1891
Ricketts, Edwin, Academy of Medicine.....Cincinnati, 1891
Ricketts, B. M., Academy of Medicine.....Cincinnati, 1884
Ridgeway, N. B., N. C. M. S.....Galion, 1878
Riggs, J. U. .....Bryan, 1873
Robb, Hunter, Cleveland Medical Society.....Cleveland, 1897
Roberds, T. W., Highland Co. Medical Society.....Bell, 1892
Rodebaugh, Henry A. .....Marysville, 1890
Rodgers, J. H. .....Louisville, 1889
Rogers, H. W., Cleveland Medical Society.....Cleveland, 1892
Rogers, W. K., Academy of Medicine.....Columbus, 1895
ROGERS, J. H., Clarke Co. Medical Society.....Springfield, 1859
Romspert, J. A., Montgomery Co. Medical Society, Dayton Asylum, 1892
Root, H. A., Toledo Medical Ass'n.....Toledo, 1892
Rosenwasser, M., Cleveland Medical Society.....Cleveland, 1880
Rosengrant, Thos. S. .....Batesville, 1894
Rouse, Wm. L., Greene Co. Medical Society.....Paintersville, 1896
Row, Geo. T., Pickaway Co. Medical Society.....Circleville, 1881
Rudy, A. S., Allen Co. Medical Society.....Lima, 1892
Russell, E. S., Tuscarawas Co. M. S.....Alliance, 1880
Russell, Geo. C., Cuyahoga Co. M. S.....Cleveland, 1892
Russell, John E., N. C. O. M. S.....Mt. Vernon, 1897

Rutter, H. C. .....Gallipolis, 1897
Ryan, Michael, Mercer Co. Medical Society.....Dayton, 1899
Sabin, Thos. M. .....Warren, 1893
Sager, B. E., Cleveland Medical Society.....Cleveland, 1897
Sager, Jos., N. W. O. M. A.....Celina, 1882
Sampson, G. W. .....Upper Sandusky, 1895
Sanders, A. F., Academy of Medicine.....Cincinnati, 1899
Santee, Leon B., Stark Co. M. S.....Marlborough, 1885
Sattler, Robert, Academy of Medicine.....Cincinnati, 1872
Sawyer, J. P., Cleveland Medical Society.....Cleveland, 1892
Schnetzler, A. C., Toledo Medical Ass'n.....Toledo, 1899
Schnetzler, H. Marcus, Toledo Medical Ass'n.....Toledo, 1874
Schooley, Lindley .....Belmont, 1894
Schutzbach, J. C., Tuscarawas Co. M. S.....Strasburg, 1892
Schwab, Louis, Academy of Medicine.....Cincinnati, 1892
Schwab, Emanuel, Academy of Medicine.....Cincinnati, 1892
Scott, B. B., Knox Co. Medical Society.....Mt. Vernon, 1892
Scott, N. Stone, Cleveland Medical Society.....Cleveland, 1892
Scott, Wm. Alfred, Fulton Co.....Swanton, 1878
Scott, X. C., N. E. O. M. A.....Cleveland, 1874
SCOVILLE, S. S., Warren Co. Medical Society.....Lebanon, 1859
Sears, O. T., Erie Co. Medical Society.....Put-in-Bay, 1892
Sewell, S. G., Greene Co. Medical Society.....New Burlington, 1892
Seys, H. H., Clarke Co. M. S.....Springfield, 1899
Shaller, John M., Academy of Medicine.....Cincinnati, 1892
Shalliott, Peter, Tuscarawas Co. M. S.....Winesburg, 1891
Sharp, H. J. .....London, 1899
Sharp, Amos W., C. O. M. S.....Columbus, 1892
Sharp, B. M., Shelby Co. Medical Society.....Sidney, 1885
Shaw, Wm. E., Academy of Medicine.....Cincinnati, 1892
Sheldon, S. B., Brown Co. Medical Society.....Five Mile, 1882
Sherman, H. G., Cleveland Medical Society.....Cleveland, 1892
Shie, Daniel P., Wayne Co. M. S.....Fredericksburg, 1897
Shriner, P. D.....Columbus, 1895
Silbaugh, John J. .....Lancaster, 1899
Silver, D. R., Shelby Co. Medical Society.....Sidney, 1870
SINNETT, E., Licking Co. Medical Society.....Granville, 1850
Sipher, J. N., Cleveland Medical Society.....Cleveland, 1892
Sittel, Theo., Academy of Medicine.....Cincinnati, 1892
Skeel, R. E., Cleveland Medical Society.....Cleveland, 1892
Slocum, Chas. E., N. W. O. M. A.....Defiance, 1874
Smith, D. M. .....Newark, 1895
Smith, Wm. G., Portage Co. Medical Society.....Ravenna, 1885

Smith, H. H. .....Lexington, 1892
Smith, J. M., Tuscarawas Co. M. S.....New Philadelphia, 1884
Smith, Chas. N., Toledo Medical Ass'n.....Toledo, 1887
Smith, D. B., Cleveland Medical Society .....Cleveland, 1892
Smith, C. W., Cleveland Medical Society.....Cleveland, 1897
Smith, Frederick K., Cuyahoga Co. M. S.....Warren, 1897
Snodgrass, Jessie, N. W. O. M. A.....Kenton, 1887
Snyder, C. .....London, 1895
SNYDER, D. J., Harrison Co. Medical Society.....Scio, 1850
Snyder, Darlington J. .....Columbus, 1899
Snyder, S. P. .....New Bedford, 1882
Snyder, Walter H., Toledo Medical Ass'n.....Toledo, 1896
Sonders, B. A., Guernsey Co. Medical Society.....Cambridge, 1899
Souder, R. L., N. W. O. M. A.....Nevada, 1892
Souders, Samuel, Montgomery Co. M. S.....Dean, 1879
Southard, John Q.....Marysville, 1882
Speidel, C. G. E., Academy of Medicine.....Cincinnati, 1892
Spencer, E. R., N. E. O. M. A.....Doylestown, 1885
Spenzer, John G., Cleveland Medical Society.....Cleveland, 1896
Spurney, A. F., Cleveland Medical Society.....Cleveland, 1897
Stamm, M., Sandusky Co.....Fremont, 1891
Stanley, E. .....Sandusky, 1870
STANSELL, J. A. .....Forest, 1866
Stanton, Byron, Academy of Medicine.....Cincinnati, 1892
Stark, Sigmar, Academy of Medicine.....Cincinnati, 1892
Steel, Robert G., Seneca Co. Medical Society.....Melmore, 1897
Stein, G. S., Academy of Medicine.....Columbus, 1888
Steiner, D. W., Allen Co. Medical Society.....Lima, 1890
Stephenson, Y., Brown Co. M. S.....Georgetown, 1892
Stevens, E. S., Warren Co. Medical Society.....Lebanon, 1886
Stevenson, George W., Cleveland Medical Society.....Cleveland, 1892
Stewart, John O., Green Co. M. S.....Cedarville, 1892
Stewart, Wm. D., Toledo Medical Ass'n.....Toledo, 1887
Stewart, Thos. H.....Church Hill, 1877
Stewart, Robert W., Academy of Medicine.....Cincinnati, 1892
Stillman, F. L., Academy of Medicine.....Columbus, 1895
Stinson, Chas. H. .....Newark, 1894
Stitt, John J. .....Rising Sun, 1899
Stockton, Geo., Academy of Medicine.....Columbus, 1895
STOCKSTILL, J. N., Clarke Co.....New Carlisle, 1857
Storey, Wm., Erie Co. Medical Society.....Castalia, 1884
Straight, Howard S., Cleveland Medical Society.....Cleveland, 1892
Strain, A. J., Madison Co. M. S.....London, 1899

Stricker, L., Academy of Medicine.....Cincinnati, 1895
Stucky, J. G., Holmes Co.....Walnut Creek, 1897
Sudhoff, Geo. F., Academy of Medicine.....Cincinnati, 1892
SWENEY, R. L. .....Marion, 1859
Swisher, A. B. .....Marysville, 1898
Sykora, J., Cleveland Medical Society.....Cleveland, 1892
Sylvester, John E., Jackson Co.....Wellston, 1898
Syman, S. S. .....Springfield, 1899
Taggart, H. D., Summit Co. M. S.....Akron, 1892
Talley, C. F. .....Hyattsville, 1895
Tangeman, C. W., Academy of Medicine.....Cincinnati, 1888
Tauber, B., Academy of Medicine.....Cincinnati, 1899
Taylor, J. B., N. C. O. M. S.....Broadway, 1899
Taylor, Wm. H., Academy of Medicine.....Cincinnati, 1874
Taylor, Clovis M.....Columbus, 1894
Taylor, Fred C., Cleveland Medical Society.....Cleveland, 1897
Teachnor, W., Hempstead Academy of Medicine.....Sciotoville, 1899
Telfair, Geo. M., Clinton Co. Medical Society.....Bloomington, 1884
Templeton, A. M., Muskingum Co. M. S.....Zanesville, 1892
Thomas, B. A., Perry Co. Medical Society.....Rushville, 1899
Thomas, Frank W., Marion Co. M. S.....Marion, 1884
Thompson, Chas. A. .....Raymond, 1899
Thompson, C. E., Champaign Co. M. S.....North Lewisburgh, 1896
Thompson, F. E., Morrow Co. Medical Society.....Marengo, 1895
Thompson, J. A., Academy of Medicine.....Cincinnati, 1892
Thompson, S. R., Tuscarawas Co. M. S.....Urichsville, 1892
Thompson, W. E. .....St. Clairsville, 1897
Thorn, S. S., Toledo Medical Ass'n.....Toledo, 1873
Thorner, Max, Academy of Medicine.....Cincinnati, 1892
Thrasher, A. B., Academy of Medicine.....Cincinnati, 1886
TICHENOR, E. J., Warren Co. M. S.....Lebanon, 1869
Timberman, Andrew, Academy of Medicine.....Columbus, 1898
Titlow, Benatta D., Clarke Co. M. S.....Springfield, 1892
Tobey, Henry A., Toledo Medical Ass'n.....Toledo, 1878
Todd, J. H., Wayne Co. Medical Society.....Wooster, 1892
Tower, B. M., Ashtabula, Lake and Geauga Co. M. S., Conneaut, 1892
Towslee, Lillian G., Cleveland Medical Society.....Cleveland, 1897
Tracy, Jas. L., Toledo Medical Ass'n.....Toledo, 1892
Trimble, C. E., Crawford Co. M. S.....Crestline, 1892
Trimble, R. T., Clinton Co. M. S.....New Vienna, 1881
Trout, J. Frances.....Lancaster, 1895
Trush, J., Academy of Medicine.....Cincinnati, 1892
Tuckerman, L. B., Cleveland Medical Society.....Cleveland, 1891

Tydings, O., Piqua Society Clinical Medicine.....Piqua, 1892
Uhler, H. L., Marion Co. Medical Society.....Marion, 1895
Upson, Henry S., Cleveland Medical Society.....Cleveland, 1888
Upson, Geo. D., Cleveland Medical Society.....Cleveland, 1897
Vail, D. T., Academy of Medicine.....Cincinnati, 1892
Van Nette, Wesley, Crawford Co. M. S.....Poplar, 1892
Van Pelt, Chas. L., Toledo Medical Association.....Toledo, 1887
Vance, A. H., Clarke Co. M. S.....Springfield, 1899
VANDERVOORT, J. W., Warren Co. M. S.....Harveysburg, 1864
VANNATA, E., Muskingum Co. M. S.....Fultonham, 1855
Vigor, F. A. .....New Dover, 1884
Volty, Ernest C. .....Chili, 1898
Vorhes, B. C. .....Albany, 1895
Wagenhals, F. S., Columbus Medical Society.....Columbus, 1885
Wagner, Henry P., N. W. O. M. A.....Delphos, 1892
Walker, Alonzo B., Union Medical Society.....Canton, 1882
Wall, J. J., N. E. O. M. S.....Mallet Creek, 1897
Wallace, A. H. .....Avondale, 1898
Ward, Clarence S. .....Warren, 1875
Ward, Wadsworth A., Ashtabula Co. M. S.....Conneaut, 1880
Wardlow, Yeatman .....Columbus, 1897
Warner, Frank, Academy of Medicine.....Columbus, 1884
Warner, C. J., N. C. O. M. S.....Congress, 1892
Waters, Geo. M., Academy of Medicine.....Columbus, 1896
Watkins, C. D. .....Etna, 1898
Watson, G. N., Cleveland Medical Society.....Cleveland, 1892
WEAVER, J. M., Montgomery Co. M. S.....Dayton, 1865
Weber, Wm. C., Cleveland Medical Society.....Cleveland, 1889
Webster, J. V., Belmont Co. Medical Society.....Flushing, 1890
Weed, Theo. A. .....Cleveland, 1880
Welch, Absalom J. .....Mt. Sterling, 1890
Wenner, R. J., Cleveland Medical Society.....Cleveland, 1896
Wenning, W. H., Academy of Medicine.....Cincinnati, 1892
West, T. J., N. W. O. M. A.....Tiffin, 1875
West, J. P., Belmont Co. Medical Society.....Bellaire, 1892
Whelan, Ray E., Mahoning Co. M. S.....Youngstown, 1897
Whitaker, H. W., C. O. M. S.....Columbus, 1895
White, D. K., Cleveland and Cuyahoga Co. M. S.....Cleveland, 1899
White, Wilford, Cleveland Medical Society.....Ravenna, 1897
Whitmer, J. E. .....Millersburg, 1892
Whittaker, James T., Academy of Medicine.....Cincinnati, 1871
Wilcox, S. S., Academy of Medicine.....Columbus, 1895
Willard, G. P., N. W. O M. A.....Tiffin, 1875

Williams, Brady O., E. O. M. S.....Martin's Ferry, 1891
Williams, T. B., Cleveland Medical Society.....Cleveland, 1886
Williams, W. E., Hempstead Academy of Medicine.....Jackson, 1895
Williamson, A. M., Montgomery Co. M. S.....Dayton, 1892
Willson, C. H., Pike County Medical Society.....Idaho, 1895
WILLSON, WM. H., Adams Co. Medical Society.....Greenfield, 1865
Wilson, D. C. .....Ironton, 1872
Wilson, E. F., Academy of Medicine.....Columbus, 1899
Wilson, E. J. .....Columbus, 1895
Wilson, Milo .....Gilboa, 1898
Wilson, S. S., Greene Co Medical Society.....Xenia, 1899
Winders, Frank, N. W. O. M. S.....Columbus, 1896
Wirt, W. H. .....Londonville, 1899
Wirt, Wm. E., Cleveland Medical Society.....Cleveland, 1891
Wirth, R., Academy of Medicine.....Columbus, 1886
Withrow, J. M., Academy of Medicine.....Cincinnati, 1892
Wittich, R. B. .....Mt. Sterling, 1899
Wolfe, A. C., Academy of Medicine.....Columbus, 1896
Wood, John S. .....Cleveland, Collinwood, 1880
Wood, W. H., Jefferson Co. M. S.....Smithfield, 1892
Woodruff, E. W. .....Columbus, 1895
WOODS, JOS. T., Toledo Medical Ass'n.....Toledo, 1862
Woods, Elizabeth, Toledo Medical Ass'n.....Toledo, 1892
WOODRUFF, L., C. O. M. S.....Alton, 1867
Woodworth, W. H. .....Delaware, 1895
Wren, Wm. G. .....Columbus, 1898
Wright, J. A., N. W. O. M. A.....Toledo, 1892
Wright, James H.....New Lexington, 1894
Wright, John W. .....Columbus, 1885
Wright, S. St. J., Summit Co. M. S.....Tallmadge, 1880
Wright, Thos. M., Miami Co. Medical Society.....Troy, 1891
Wylie, J. L., Brown Co. Medical Society.....Ripley, 1872
Yarnall, F. H., Hildreth District M. S.....W. Lafayette, 1892
Yocum, L. A., Wayne Co. M. S.....Wooster, 1897
Young, D. Howard, Erie Co. M. S.....Chicago, 1892
Zenner, Phillip, Academy of Medicine.....Cincinnati, 1882
Zimmerman, H. A. .....Youngstown, 1892
Zinke, E. G., Academy of Medicine.....Cincinnati, 1892
Zopfi, W. J., Hancock Co. M. S.....Findlay, 1891

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Black, A. P.

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Howells, James Owen.

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Castalia—
Storey, Wm.

Cedarville—
Stewart, John O.

Celina—
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Voltz, E. C.

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Lash, Josiah W.
Leslie, J. M.

Church Hill—
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Eichberg, Jos.
Everts, Orpheus.
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Fisher, P.
Fitzpatrick, T. V.
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Foertmeyer, C. H.
Fogel, L. J.
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Grimm, Adolph.

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Hoppe, H. H.
Hottendorf, Louis P.
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Joseph, Leopold.
Judkins, C. P.
Judkins, Wm.
Junkerman, Geo. S.
Kammann, Albert A.
Keck, Peter A.
Kiely, W. E.
King, J. R.
Koehler, Max.
Krouse, Louis J.
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McKee, Edward S.
McKeenie, Josiah B.
Mackenzie, J. C.
Malsbary, Geo. E.
Marsh, F. O.
Mitchell, E. W.
Murphy, John A.
Murphy, John W.
Oliver, J. C.
Palmer, Chauncey D.
Porter, W. D.
Ransohoff, Joseph.
Ravogli, Augustus.
REAMY; THAD. A.
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Ricketts, Edwin.
Sanders, A. F.
Sattler, Robert.
Schwab, Emmanuel.
Schwab, Louis.
Seeley, W. W.
Shaw, Wm. E.
Shaller, John M.
Shields, E. H.
Sittel, Theo.
Speidel, C. G. E.
Stanton, Byron.

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Stewart, Robert W.
Stricker, L.
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Thorner, Max.
Thrasher, A. B.
Trush, J.
Vail, D. T.
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Row, Geo. T.

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Hous, Geo. W.

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Brashear, B. B.
Brockett, A. J.
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Bunts, Frank E.
Campbell, Oscar B.
Chadwick, Leroy S.
Clapp, Harold T.
Clark, Frank S.
Coates, B. O.
Cook, J. E.
Corlett, Wm. T.
Crile, Geo. W.
Cushing, Edward F.
CUSHING, H. K.
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Upson, Geo. D.
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Wirt, Wm. E.
Wood, John S.

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Ray, J. H.

Colorado—
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Columbus—
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Butler, Geo. W.
Carpenter, E. G.
Clark, C. F.
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Cooper, Albert.
Cooperrider, C. A.
Cowell, W. M.
Deuschle, W. D.
Dick, W. L.
Dixon, M. F.
Dunham, J. M.
Emerick, E. J.

Columbus—
Evans, A. E.
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Fullerton, Erskine B.
Gay, N.
Gilliam, D. Tod.
Guerin, Z. F.
Hamilton, C. S.
Hamilton, W. D.
Harper, E. A.
Hendrixson, Hugh.
Heston, J. Z.
Holmes, W. W.
Hoover, Thos. C.
Johnston, Alice M.
JONES, T. W.
Kahn, L.
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Lawrence, J. C.
Lee, M. F.
LOVING, STARLING.
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Means, Chas. S.
Means, W. J.
Moore, D. L.
Moore, H. M. W.
Nash, W. H. H.
Niel, Alexander.
Obitz, N.
Overly, John E.
Platter, H. M.
Probst, C. O.
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Rankin, Theodore W.
Richardson, Alonzo B.
Rogers, W. K.
Scatterday, W. F.
Schueller, J. B.
Sharp, Amos W.
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Stein, G. S.
Stillman, F. L.
Stockton, George.
Taylor, Clovis M.
Timberman, A.
Wagenhals, F. W.
Wardlow, Yeatman.
Warner, Frank.
Waters, Geo. M.
Whitaker, H. W.

Columbus—
White, G. M.
Wilcox, S. S.
Wilson, E. F.
Wilson, E. J.
Winders, Frank.
Wirth, R.
Wolfe, A. C.
Woodruff, E. W.
Wright, John W.

Columbus Grove—
Morris, Frank.
Morris, Joseph.

Congress—
Warner, C. J.

Conneaut—
Merriam, E. D.
Ward, Wadsworth A.

Continental—
Lewis, H. A.

Convoy—
Hall, E. V.

Cope—
Cope, E. C.

Copley—
Chapman, Bryon.

Corning—
Callinan, D. F.
Halcomb, C. B.

Coshocton—
McClair, Jesse.

Crestline—
McCallum, D. D.
Trimble, C. E

Cuyahoga Falls—
Hough, Wayland S.
Howard, A. B.

Dalton—
Haney, Josiah C.

Dayton—
Adams, P. N.
Barker, F. D.
Barrere, D. M.
Beck, John S.
Bonner, C. A.
Bonner, Horace.
Conklin, W. J.
Corbin, Lee.
Dolina, J. F.

Dayton—
Ellis, Samuel B.
Evans, Geo. B.
Goodhue, Geo.
Gray, Francis C.
Greene, D. W.
Humphrey, C. H.
Jenner, Henry G.
Jennings, Ellis.
Jewett, H. S.
Lichliter, David C.
Petitt, Richard R.
REEVE, J. C.
Reeve, J. C., Jr.
Ryan, Michael.
WEAVER, J. M.
Williamson, A. M.

Dayton Asylum—
Romspert, J. A.

Dean—
Sanders, Samuel.

Deavertown—
Folk, Peter.

Defiance—
Potts, Chas. M.
Slocum, Chas. E.

Delaware—
Chidester, C. W.
Fowler, Silas W.
Hughes, D. E.
Woodworth, W. H.

Delphos—
Wagner, Henry P.

Democracy—
Leonard, E. L.

Dennison—
Price, F. K.

Deshler—
Gehritt, T. M.

Dresden—
Dorsey, Jos. F.

Dupont—
Bird, Edw. H.
Hixton, M. M.

East Toledo—
Hathaway, Harrison.

East Liverpool—
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Ikirt, G. P.
Marshal, R. J.

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Eldorado—
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Clay, W. P.

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Etna—
Watkins, C. D.

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Lorimer, H. F.

Fayette—
Backus, L. C.

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Love, Ephriam W.

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Hurd, A.
Kimmell, J. A.
Martin, John C.
Zopfi, W. J.

Five Mile—
Sheldon, S. B.

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Hobson, John A.
Webster, J. V.

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STAUSELL, J. A.

Fostoria—
Hoege, G. L.
Keycraft, A. J.
Miller, N. C.

Franklin—
Death, H. J.
Evans, Otho.

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Martin, Jas.
Shea, Daniel P.

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Potter, S. B.

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Stamm, M.

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Albers, J. G.

Fultonham—
Axline, Chas. Z.
VANNATA, E.

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Alcorn, John B.
Ohlmacher, A. P.
Parker, E. W.
Rutter, H. C.

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Burrows, S. S.

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Marshall, R. J.
Stephenson, Y.

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Ervin, N. B.

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Mathias, A. C.
Wilson, Milo.

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Heady, J. F.

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King, W. L.
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WILLSON, WM. H.

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Hulin, O. W.

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Lowry, Jos. W.
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Jamestown—
Jones, L. M.

Jefferson—

Jersey—
Mills, J. T.

Junction City—
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Kingston Centre—
Foster, G. F.

Kenton—
Bain, Frank D.
Heestand, E. B.
McCoy, Clem. D.
Snodgrass, Jessie.

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Fox, Curtis L.

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Chamberlin, Chas. S.
Moore, Lyman G.

Kirkersville—
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Bauer, M. M.

Lancaster—
Beery, George O.
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Goss, C. W.
Goss, J. H.
Silbaugh, J. J.
Trout, J. Frances.

Lebanon—
Blair, B. H.
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SCOVILLE, S. S.
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Leetonia—
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Lima—
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Foltz, Tobias H.
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Steiner, D. W.

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London—
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Formorin, J. L.
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Rhu, August.
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Thomas, Frank W.
Uhler, H. L.

Marlborough—
Santee, Loen B.

Martin's Ferry—
Darrah, Jos. Wilson.
Williams, Brady O.

Marysville—
HENDERSON, D. W.
Henderson, G.
Henderson, L.
Mills, C. B.
Rodebaugh, Henry A.
Southard, John Q.
Swisher, A. B.

Masillon—
Miller, T. Clark.
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Reed, T. J.

Mason—
Hall, C. T.

McComb—
Hersh, E. G.

McConnellsville—
Noyes, H. J.

Mechanicsburg—
Clark, John H.
Nincehelser, O. A.

Medina—
Murray, Langdon S.

Melmore—
Steel, Robt. G.

Melville—
Hancock, W. D.

Miamisburg—
Judy, C. L.

Middletown—
Corson, O. M.
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Milford—
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Milford Centre—
Boylan, A.

Millersburg—
Bigham, J. G.
Crump, A. A., Jr.
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Whitmer, J. E.

Milo—
Albright, C. W.

Minster—
Dine, C. L.

Monroe—
Macready, James.

Montrose—
Nash, E. King.

Morrow—
Conden, John F.
MOUNTS, J. L.

Mt. Gilead—
Griffis, F. C.

Mt. Sterling—
Collins, Edgar F.
Leach Sherman.
Leach, Robert.
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Wittich, R. B.

Mt. Vernon—
Armentrout, Lyman W.
Colville, R. W.
Larimore, F. C.
Lee, J. F.
Russell, John E.
Scott, B. B.

Napoleon—
Harrison, E. B.
Maerker, A. E. H.

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Neville—
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Newark—
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North Benton—
Miller, Delbert J.
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North Lewisburgh—
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Noble, Chas. D.
Omega—
Ray, J. B.
Orrville—
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Osborn—
Marquart, Oscar M.
Ottawa—
Beardsley, C. E.
Ottoville—
Binder, Albert.
Owensville—
Combs, John S.
Oxford—
Cook, G. F.
Painesville—
House, Chas. F.
Merriman, D. J.
Paintersville—
Rouse, William L.
Patriot—
Fakins, Jehu.
Paulding—
Fauster, J. U.
Pennville—
Holcomb, Leroy S.
Perrysburg—
Hamilton, Horatio A.
Rheinfrank, J. H.
Rheinfrank, W. H.
Piqua—
Tydings, O.
Plain City—
Jenkins, M. J.
Mattoon, F. N.
Pleasant City—
Bower, H. H.
Pleasantville—
Leich, A. V.
Pomeroy—
Hoff, Jos. W.
Poplar—
Van Nette, Wesley.
Port Clinton—
De La Barre, Paul.
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Miller, John F.
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Allard, Lorenzo D.
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Kline, P. J.
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Boone, Jos. S.
Pricetown—
Chaney, S. F.
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Sears, O. T.
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Qualey—
Gage, Rawson S.
Ravenna—
Smith, Wm. G.
White, Wilford.
Raymond—
Thompson, C. A.
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Francis, A. W.
Wylie, J. L.
Rising Sun—
Stitt, J. J.

Rosewood—
Driscoll, P. B.

Rushville—
Lewis, W. C.
Thomas, B. A.

Russell—
Granger, Francis M.

Sabina—
Lightner, S. B.

Salem—
Calvin, J. H.

Salineville—
Blazer, H. E.
Lindsay, J. A.

Sandusky—
Burnham, R. D.
Graefe, Chas.
Graefe, Wm.
Haynes, J. T.
Heiter, Carl.
Merz, Chas. H.
Stanley, E.

Scio—
SNYDER, D. J.

Sciotoville—
Teachnor, W.

Shadeville—
Blake, Wm. H.

Shanesville—
Miller, A. T.

Shelby—
Myers, I. A.

Shreve—
Bertolette, Harry B.

Sidney—
Hussey, M. F.
Sharp, B. M.
Silver, D. R.

Sinking Springs—
House, L. F.

Smithfield—
Wood, W. H.

Somerset—
Hayes, J. D.

South Brooklyn—
Linden, W. E.

South Charleston—
Collins, Milton H.

South Salem—
Cox, J. M.

Sparta—
Morehouse, G. W.

Springfield—
Bell, R. L.
Bliss, C. B.
Buckingham, John M.
Dugan, J. P.
Gotwald, D. K.
Harris, E. C.
Hulick, J. W.
Hutchings, S. R.
Kay, C. H.
KAY, ISAAC.
Link, J. A.
Myers, J. E.
Myers, Noah.
Nelson, J. W.
Niles, L.
ROGERS, J. H.
Seys, H. H.
Syman, S. S.
Titlow, Benetta D.
Vance, A. H.
Wren, W. G.

Startle—
Rea, E. H.

St. Clairsville—
Hewetson, Alex. H.
Thompson, W. E.

Steubenville—
Collins, John W.
Floyd, J. C. M.
McCollough, Jos. A.
PEARCE, ENOCH.

St. Henry's—
Mory, J. J.

St. Mary's—
Longsworth, M. J.
Noble, N. T.

Stony Ridge—
Noble, Herbert E.

Strasburg—
Schutzbach, J. C.

Sulphur Springs—
Bevington, H. S.

Swanton—
Lathrop, Arthur B.
Scott, Wm. Alfred.

Thornville—
Clemson, G. W.

Tiffin—
Benner, C. T.
Gibbon, H. B.
Keller, Thos. F.
Leahy, Maurice.
McCollum, E. J.
West, T. J.
Willard, G. P.
Yingling, G. S.

Tippecanoe City—
Hartman, S. D.

Tiro—
Guiss, W. E.

Toledo—
Becker, Bernard.
Beckwith, Seth W.
Bessey, J. Mortimer.
Bodman, Lewis H.
Bond, John W.
Brand, Walter W.
Brigham, O. S.
Chapman, G. L.
Chapman, Wm. C.
Coldham, Wm. W.
Collamore, Geo. A.
Cosgrove, Thos.
Craver, S. Belle.
Curry, John H.
De Vilbiss, Allen.
Donnelly, James.
Duncan, James A.
Faber, Chas. A.
Fella, F. J.
Fisher, A. H.
Fisher, A. W.
FORBES, S. F.
Gardiner, W. G.
Gillette, Wm. J.
Hasencamp, Oscar.
Haynes, J. Purcell.
Heidrick, Louis W.
Hollister, Geo. A.
Hubbard, Thomas.
Jones, Wm. A.
Kirkley, Cyrus A.
Kitchen, Francis A.
Landman, Otto.
Lawless, James T.
McVety, A. F.
Mills, C. H.
Newton, C. W.

Toledo—
North, John.
Peter, Robert.
Pugh, Frank H.
Reed, Calvin F.
Reinhart, James C.
Root, H. A.
Roulet, Chas.
Schnetzler, A. C.
Schnetzler, H. Marcus.
Smith, Chas. N.
Snyder, Walter H.
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Thorn, S. S.
Tobey, Henry A.
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WOODS, JOS. T.
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Toronto—
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Upper Sandusky—
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Van Wert—
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Versailles—
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Wadsworth—
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Wapakoneta—
Getzloff, B.

Warren—
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Smith, Frederick K.
Ward, Clarence S.

Warrensburg—
McIntire, Wm.

Washington C. H.—
Boggess, E. M.
Howell, J. Morton.
Ireland, W. E.
Ireland, S. A.

Waterford—
Hayward, E. T.

Watertown—
Bohl, John, Sr.

Waterville—
Downs, Samuel.

Wauseon—
Hartman, Geo. W.

Waverly—
Andre, Orrin C.
Caldwell, John L.

Waynesfield—
Lusk, S. B.

Waynesville—
Oglesbee, Wm. E.

Webster—
Ballinger, J. B.

Wellston—
Sylvester, J. E.

West Alexandria—
Mundhenk, L. R.

West Cairo—
Henderson, Geo. W.

West Carlisle—
Edwards, R. C.

West Carrollton—
Krause, L. S.

West Lafayette—
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LEONARD, B. B.

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Jennings, Gainor.

West Minster—
Creps, Adolphus H.

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Hill, Wm. W.

West Union—
Bunn, Jas. W.

Williamsburg—
Redrow, I.

Wilmington—
Quinn, Allen T.

Winesburg—
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Sanders, B. A.

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Woodsfield—
Parry, J. R.

Wooster—
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Todd, J. H.
Yocum, L. A.

Worthington—
Johnson, Fred L.

Xenia—
Brundage, L. A.
Galloway, C. M.
Galloway, W. A.
Messenger, A. C.
Wilson, S. S.

Yellow Springs—
Humphrey, W. H.

Youngstown—
Buechner, W. L.
Clark, Ida.
Clark, Myron S.
Cone, J. E.
McCurdy, John.
Whelan, Ray E.
Zimmerman, H. A.

Zanesville—
Brush, Edmund C.
Crider, Chas. L.
Crossland, Jeff. C.
Culbertson, Louis Rogers.
Fassig, J. M.
Holston, J. G. F.
Knapp, C. C.

Zanesville—
Lenhart, Charles M.
Melick, Wm. A.
Patrick, Nathan E.
Rambo, Cyrus M.
Templeton, A. M.
Templeton, B. F.
Wiseman, Osbourne M.

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Barnes, Noble P., 611 Maryland Ave.....Washington, D. C., 1894
Brashear, B. B., Cuyahoga Co.....Atlantic City, N. J., 1896
Getzloff, B. .....Grand Haven, Mich.
Hill, Frank E., Clermont Co. M. S.....Mt. Auburn, Ky., 1892
Jackson, T. W., N. E. O. M. A.....Philadelphia, Pa., 1895
Jones, Geo. E. .....Connersville, Ind., 1892
Kurtz, C. E. .....4460 Berkely Avenue, Chicago, Ill.
McCurdy, S. L. .....Pittsburg, Pa., 1882
Nunnemacker, H. B.....44th and Market Streets, Philadelphia, Pa.
Reed, R. Harvey, N. C. O. M. A.....Rock Springs, Wyoming, 1884
Spence, J. A., Wellsville Med. Soc.....Pittsburg, Pa., 1888
White, G. M. .....Fort Myers, Fla., 1888
Woodbridge, John E., Mahoning Co. M. S.....Chicago, Ill., 1886

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Bartholow, Roberts, M. D.....Philadelphia, Pa., 1879
Beeman, P., M. D.....Sidney, 1872
Blackburn, J. C., M. D.....Covington, Ky., 1857
Daland, Judson, M. D.....Philadelphia, Pa., 1895
Harding, M. H., M. D.....Lawrenceburg, Ind., 1854
Haughton, R. E., M. D.....Richmond, Ind., 1863
Hibbard, Jas. F., M. D.....Richmond, Ind., 1871
Hill, E. L., M. D.....Oxford, 1856
Jenks, E. W., M. D.....Detroit, Mich., 1875
Kerr, John, M. D.....Canton, China, 1875
Kitchen, J. M., M. D.....Indianapolis, Ind., 1866
Lyons, W. B., M. D.....Huntington, Ind., 1866
Maclean, Donald, M. D.....Detroit, Mich., 1894
Marcy, H. O., M. D.....Boston, Mass., 1897
Noyes, J. F., M. D.....Detroit, Mich., 1875
Pilcher, Capt. J. E.....U. S. Army, 1896
Robb, Hunter, M. D. (Permanent Member, 1897)..Cleveland, 1894
Safford, E. D., M. D.....Parkersburg, W. Va., 1870
Senn, N., M. D.....Chicago, 1890
Shoemaker, John V., M. D.....Philadelphia, Pa., 1899
Stevenson, J. M., M. D.....Pittsburg, Pa., 1866
Sutton, R. S., M. D.....Pittsburg, Pa., 1884
Vaughan, Victor C., M. D.....Ann Arbor, Mich., 1889

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Baldwin, J. F. ..... Columbus.
Barnhill, Jas. U. ..... Columbus.
Blake, Francis W. ..... Columbus.
Brush, E. C. ..... Zanesville.
Coleman, N. R. ..... Columbus.
Cooper, Albert ..... Columbus.
Dandridge, N. P. ..... Cincinnati.
Davidson, N. P. ..... Hilliards.
Foshay, P. M. ..... Cleveland.
Hall, Rufus B. ..... Cincinnati.
Hall, Joe A. ..... Troy.
Hamilton, W. D. ..... Columbus.
Hamilton, C. S. ..... Columbus.
Johnson, F. L. ..... Worthington.
Lawrence, F. F. ..... Columbus.
Leach, Sherman ..... Columbus.
Means, W. J. ..... Columbus.
Oliver, John C. ..... Cincinnati.
Platter, H. M. ..... Columbus.
Scott, X. C. ..... Cleveland.
Sharp, H. J. ..... London.
Snyder, Darlington ..... Columbus.
Tuckerman, L. B. ..... Cleveland.
Winders, Frank ..... Columbus.
Woodruff, Elwood ..... Alton.

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Beery, George O.....Lancaster, 1899
Bell, R. L., Clark Co. Medical Society.....Springfield, 1899
Binder, Albert, Northwestern Ohio Med. Ass'n.....Ottoville, 1899
Black, Albert P.....Bradner, 1899
Bliss, C. B., Clark Co. Medical Society.....Springfield, 1899
Bown, H. H., Guernsey Co. Medical Society...Pleasant City, 1899
Chapman, Geo. L.....Toledo, 1899
Coleman, Warren, Miami Co. Medical Society.....Troy, 1899
Colville, Robert W.....Mt. Vernon, 1899
Courtright, T. E.....Kirkersville, 1899
Driscoll, Park B., Champaign Co. Medical Society, Rosewood, 1899
Dugan, John P., Clark Co. Medical Society.....Springfield, 1899
Fauster, John U., Northwestern Ohio Med. Ass'n..Paulding, 1899
Gaither, Alfred, Cincinnati Academy of Medicine..Cincinnati, 1899
Gotwald, D. K., Clark Co. Medical Society.....Springfield, 1899
Green, Jos. H., Miami Co. Medical Society.....Troy, 1899
Gutermuth, W. C.....Versailles, 1899
Hall, Joe A., Miami County Medical Society.....Troy, 1899
Harris, E. C., Clark Co. Medical Society.....Springfield, 1899
Harris, J. H.....Clifton, 1899
Heady, Jas. F., Cincinnati Academy of Medicine.....Glendale, 1899
Henderson, L.....Marysville, 1899
Henderson, G.....Marysville, 1899
House, L. F., Highland Co. Medical Society..Sinking Spring, 1899
Humphrey, W. H., Greene Co. Medical Sociey.Yellow Springs, 1899
Hutchings, S. R., Clark Co. Medical Society.....Springfield, 1899
Johnstone, A. W., Cincinnati Academy of Medicine.Cincinnati, 1899
Kay, C. H., Clark Co. Medical Society.....Springfield, 1899
Kiester, W. H.....Arcanum, 1899
King, W. L.....Granville, 1899
Kinnison, U. L., Jackson Co. Medical Society.....Jackson, 1899
Knapp, C. C.....Zanesville, 1899
Lambright, S., Miami Valley Medical Society.South Lebanon, 1899
Lee, M. F.....Columbus, 1899
Lewis, H. A., Northwestern Ohio Med. Ass'n....Continental, 1899

Link, Jos. A., Clark Co. Medical Society.....Springfield, 1899
Lowny, O. F., Guernsey Co. Medical Society.....Cambridge, 1899
Lucas, A. O.....New Washington, 1899
McCallum, D. D.....Crestline, 1899
McClain, Jesse.....Coshocton, 1899
Mundhenk, L. R., Preble Co. Med. Society..West Alexandria, 1899
Nincehelser, O. A., Champaign Co. Med. So..Mechanicsburg, 1899
Parker, E. W.....Gallipolis, 1899
Price, H. H., Guernsey Co. Medical Society.....Cambridge, 1899
Ramsey, W. T., Guernsey Co. Medical Society...Cambridge, 1899
Reason, J. W.....Hilliards, 1899
Ryan, Michael, Mercer Co. Medical Society.....Dayton, 1899
Sanders, A. F., Cincinnati Academy of Medicine..Cincinnati, 1899
Sanders, B. A., Guernsey Co. Medical Society.....Winterset, 1899
Schnetzler, A. C., Toledo Medical Association.....Toledo, 1899
Seys, H. H., Clark Co. Medical Society.....Springfield, 1899
Sharp, H. J.....London, 1899
Silbaugh, John J.....Lancaster, 1899
Snyder, Darlington J.....Columbus, 1899
Stitt, John J.....Rising Sun, 1899
Strain, A. J., Madison Co. Medical Society.....London, 1899
Syman, S. S.....Springfield, 1899
Taylor, J. B., North Central Ohio Medical Society.Broadway, 1899
Tauber, B., Cincinnati Academy of Medicine.....Cincinnati, 1899
Teachnor, W., Hempstead Academy of Medicine..Sciotoville, 1899
Thomas, B. A., Perry Co. Medical Society.....Rushville, 1899
Thompson, Chas. A.....Raymond, 1899
Vance, A. H., Clark Co. Medical Society.....Springfield, 1899
Wirt, W. H.....Londonville, 1899
Wilson, S. S., Greene Co. Medical Society.....Xenia, 1899
Wilson, E. F., Columbus Academy of Medicine.....Columbus, 1899
White, D. K., Cleveland & Cuyahoga Co. Societies.Cleveland, 1899
Wittich, R. B.....Mt. Sterling, 1899

Members elected at Springfield meeting, 68.

PHYSICIANS REGISTERED AT SPRINGFIELD, OHIO, MAY 10, 11, 12, 1899

P. R. Bennett.....Daytona, Fla.
A. S. Rudy.....Lima.
C. W. Lehman.....Eaton.
Edward S. Stevens.....Lebanon.
W. W. Hamer.....Bellefontaine.
Jehu Eakins.....Patriot.
W. H. Humphrey.....Yellow Springs.
John W. Hulick.....Springfield.
B. H. Blair.....Lebanon.
W. W. Pennell.....Fredericktown.
E. Gustave Zinke.....Cincinnati.
C. E. Beardsley.....Ottawa.
A. Binder.....Ottoville.
Wm. Guy Wren.....Columbus.
N. Stone Scott.....Cleveland.
John P. Dugan.....Springfield.
E. C. Harris.....Springfield.
Mary Jordan Finley.....Mansfield.
S. S. Syman.....Springfield.
John A. Thompson .....Cincinnati.
J. R. Parry.....Woodsfield.
J. H. Harris.....Clifton.
D. K. Gotwald.....Springfield.
T. F. Bliss.....Springfield.
Frank Winders.....Columbus.
Bennetta D. Titlow.....Springfield.
John M. Buckingham.....Springfield.
Joe A. Hall.....Troy.
M. H. Collins.....South Charleston.
N. P. Davidson.....Hilliard.
W. S. Hunt.....Springfield.
Lindley F. House.....Sinking Spring.
J. M. Carter.....Jackson Centre.
Charles A. L. Reed.....Cincinnati.
J. M. Wine.....Dayton.

Wm. H. Humiston.....Cleveland.
Allen H. Vance.....Springfield.
W. J. Means.....Columbus.
L. Woodruff.....Alton.
A. J. Willey.....Delaware.
C. N. Smith.....Toledo.
A. B. Walker.....Canton.
Arthur W. Johnstone.....Cincinnati.
P. Max Foshay.....Cleveland.
John H. Rodgers.....Springfield.
John P. Sawyer.....Cleveland.
G. A. Collamore.....Toledo.
Wm. Thos. Corlett.....Cleveland.
H. G. Sherman.....Cleveland.
D. S. Hanson.....Cleveland.
Thad. A. Reamy.....Cincinnati.
Isaac Kay.....Springfield.
Horace L. Heistand.....Donnelsville.
G. H. Searcy.....Muncie, Ind.
D. N. Kinsman.....Columbus.
O. M. Marquart.....Osborn.
Hugh F. Lorimer.....Fair Haven.
D. C. Wilson.....Ironton.
S. S. Scoville.....Lebanon.
Hunter Robb.....Cleveland.
F. F. Lawrence.....Columbus.
S. B. McGavran.....Cadiz.
J. U. Barnhill.....Columbus.
John J. Moore.....South Charleston.
L. W. Herrington.....Elida.
F. C. Larimore.....Mt. Vernon.
N. R. Coleman.....Columbus.
Edwin Ricketts.....Cincinnati.
James A. Duncan.....Toledo.
W. Underwood.....Springfield.
E. Underwood.....Springfield.
W. W. Prince.....Springfield.
Clarence H. Kay.....Springfield.
A. J. Strain.....London.
I. A. Myers.....Shelby.
O. C. Andre.....Waverly.
J. A. Hines.....Van Wert.

D. W. Henderson.....Marysville.
J. Q. Southard.....Marysville.
B. C. Vorhes.....Albany.
M. B. Newhouse.....Magnetic Springs.
Albert Cooper .....Columbus.
F. L. Johnson.....Worthington.
W. H. Guiss.....Tiro.
H. A. Rodebaugh .....Marysville.
Chas. A. Thompson.....Raymond.
John C. Oliver.....Cincinnati.
J. S. Carlton.....Big Plain.
Wm. H. Taylor.....Cincinnati.
Wm. Jordan Taylor .....Cincinnati.
Chas. Graefe .....Sandusky.
Jesse Snodgrass .....Kenton.
Frank D. Bain.....Kenton.
A. H. McCullough.....Mansfield.
C. O. Probst.....Columbus.
H. S. Preston .....Mutual.
C. W. Chidester .....Delaware.
Geo. E. Orebaugh.....New Petersburg.
C. F. Clark.....Columbus.
A. T. Quinn.....Wilmington.
H. B. Gibbon.....Tiffin.
G. W. Wire.....Wilmington.
L. E. Niles.....Springfield.
W. C. Chapman.....Toledo.
H. J. Sharp.....London.
G. F. Brubaker .....Springfield.
W. A. Hall.....Chillicothe.
J. W. Hughey.....Washington, C. H.
Frank Warner.....Columbus.
E. A. Harper.....Columbus.
H. A. Beeson.....Leesburg.
F. L. Riegel.....North Hampton.
W. J. Conklin.....Dayton.
S. S. Wilson.....Xenia.
J. E. Dale.....Yellow Springs.
D. R. Silver.....Sidney.
S. A. Marshall.....Jeffersonville.
Chas. A. Teeters.....Jeffersonville.
A. H. Brundage.....Xenia.

C. M. Galloway.....Xenia.
E. W. Woodruff.....Columbus.
Edwin F. Wilson.....Columbus.
J. F. Fitzsimmons.....Bucyrus.
L. B. Tuckerman.....Cleveland.
Alex. Neil.....Columbus.
W. Coleman .....Troy.
Jos. H. Green.....Troy.
Francis W. Blake.....Columbus.
L. S. Hoover.....Laura.
M. V. Patton .....Springfield.
C. B. Bliss.....Springfield.
John G. Reed.....Cincinnati.
E. E. Fowler.....South Solon.
V. Z Miller.....Brookville.
H. J. Death.....Franklin.
D. L. Sullivan.....Urbana.
A. M. Bleile.....Columbus.
O. Evans .....Franklin.
G. B. Evans.....Dayton.
S. M. Mosgrove.....Urbana.
C. W. Hustand.....Springfield.
Louis Schwab .....Cincinnati.
C. H. Humphreys.....Dayton.
James F. Heady.....Glendale.
D. W. Steiner.....Lima.
John U. Fauster.....Paulding.
E. G. Carpenter.....Columbus.
J. C. Culbertson.....Cincinnati.
J. B. Owsley.....Jacksonboro.
C. W. Evans.....Springfield.
W. S. Philips.....Belle Center.
S. G. Sewell .....New Burlington.
M. T. Love.....Shelby.
P. B. Driscoll.....Rosewood.
G. W. Sampson.....Upper Sandusky.
Sherman Leach .....Columbus.
Rufus B. Hall.....Cincinnati.
Dickson L. Moore.....Columbus.
A. McClintock.....New Moorefield.
J. H. Ray.....Coalton.
J. L. Gahm.....Jackson.

Harry S. Jones.....Columbus.
C. L. Harrod.....Martinsburg.
J. H. Davisson .....Dayton.
Horace Bonner .....Dayton.
C. C. Agin .....Cincinnati.
W. D. Haines .....Cincinnati.
Arthur C. Bauer .....Cincinnati.
Starling Loving .....Columbus.
Ben Davis.....New Carlisle.
F. C. Gray.....Dayton.
N. P. Dandridge.....Cincinnati.
C. H. Willson.....Cedarville.
J. O. Stewart.....Cedarville.
D. W. Green.....Dayton.
John H. Wolfe.....Kings Creek.
Benj. F. Lyle .....Cincinnati.
James Donnelly .....Toledo.
J. E. Brown.....Columbus.
Geo. E. Malsbary .....Cincinnati.
Samuel Souders .....Dean P. O.
L. M. McFadden .....Staunton.
C. D. Mills.....Marysville.
Harmon Good.....Sulphur Grove.
J. H. Dersch.....Harrod.

Total registration, Springfield meeting, 185.

SOCIETIES AUXILIARY TO THE OHIO STATE MEDICAL SOCIETY

Societies	Secretaries
Adams Co. M. S.	James W. Bunn, West Union.
Allen Co. M. S.	I. F. Steiner, Lima.
Ashland Co. M. S.	R. C. Kinnaman, Ashland.
Ashtabula, Lake & Geauga M. S.	F. W. Fisher, Ashtabula.
Belmont Co. M. S.	J. S. McClellan, Bellaire.
Brown Co. M. S.	L. Markley, Georgetown.
Butler Co. M. S.	Aug. Schumacher, Hamilton.
Central Ohio M. S.	E. M. Hatton, Columbus.
Champaign Co. M. S.	E. W. Ludlow, Urbana.
Cincinnati Academy of Medicine	Robert Ingram, Cincinnati.
Clarke Co. M. S.	B. D. Titlow, Springfield.
Clermont Co. M. S.	E. C. Ireton, Marathon.
Cleveland M. S.	R. J. Wenner, Cleveland.
Clinton Co. M. S.	E. Briggs, Wilmington.
Columbus Academy of Medicine	W. D. Deuschle, Columbus.
Crawford Co. M. S.	Lucia Kemp, Bucyrus.
Cuyahoga Co. M. S.	C. C. Stuart, Cleveland.
Defiance Co. M. S.	G. W. Huffman, Defiance.
Delaware Co. M. S.	J. B. Woodworth, Delaware.
Eastern Ohio Medical Ass'n	J. C. M. Floyd, Steubenville.
East Liverpool Medical Ass'n	F. Laughlin, East Liverpool.
Erie Co. M. S.	A. F. Cook, Sandusky.
Gallia Co. M. S.	J. B. Alcorn, Gallipolis.
Greene Co. M. S.	A. C. Messenger, Xenia.
Hancock Co. M. S.	D. C. Hughes, Findlay.
Hempstead Memorial Acad. of Med.	M. S. Prixley, Portsmouth.
Highland Co. M. S.	Lockhart Nelson, Hillsboro.
Holmes Co. M. S.	D. S. Olmstead, Millersburg.
Jackson Co. M. S.	W. R. Evans, Jackson.
Jefferson Co. M. S.	A. A. Elliott, Steubenville.
Lorain Co. M. S.	E. V. Hug, Lorain.
Lucas Co. M. S.	J. A. Wright, Toledo.
Mahoning Co. M. S.	R. E. Whelan, Youngstown.
Mansfield Academy of Medicine	B. F. Harding, Mansfield.
Marion Co. M. S.	R. Ramroth, Marion.

Meigs Co. M. S.....D. Sisson, Middleport.
Miami Co. M. S.....R. M. Shannon, Piqua.
Miami Valley M. S.....S. Lambright, South Lebanon.
Montgomery Co. M. S.....Webster Smith, Dayton.
Morrow Co. M. S.....E. C. Griffis, Mt. Gilead.
Muskingum Co. M. S.....Anna M. Hill, Zanesville.
North Central Ohio M. S.....J. Lillian McBride, Mansfield.
Northwestern Ohio Med. Ass'n.....J. P. Baker, Findlay.
Perry Co. M. S.....J. G. McDougal, New Lexington.
Pickaway Co. M. S.....G. W. Heffner, Circleville.
Pike Co. M. S.....J. L. Caldwell, Waverly.
Portage Co. M. S.....George J. Waggoner, Ravenna.
Ross Co. M. S.....E. H. Smallwood, Chillicothe.
Sandusky Co. M. S.....M. O. Phillips, Fremont.
Shelby Co. M. S.....B. M. Sharp, Sidney.
Springfield Academy of Medicine.....O. H. Evans, Springfield.
Stark Co. Academy of Medicine.....R. J. Pumphrey, Massillon.
Stillwater M. S.....D. W. Copeland, Somerton.
Toledo Medical Ass'n.....C. P. Wagar, Toledo.
Tuscarawas Co. M. S.....Nancy D. Richards, New Philadelphia.
Union Medical Ass'n.....Della M. Walker, Salem.
Union Med. Ass'n of N. E. Ohio.....J. H. Seiler, Akron.
Warren Co. M. S.....E. S. Stevens, Lebanon.
Washington Co. M. S.....J. B. McClure, Marietta.
Wayne Co. M. S.....J. D. Beer, Wooster.

List of the Members of the Local Medical Societies Auxiliary to the Ohio State Medical Society

ADAMS COUNTY MEDICAL SOCIETY.

Auxiliary since 1888 Annual Meeting in June

W. K. Coleman.....President.
R. A. Stephenson.....Vice President.
James W. Bunn.....Secretary.
D. B. Kirkpatrick.....Treasurer.

MEMBERS

Berry, J. S., Peebles.
Bunn, James W., West Union.
Carboy, C. S., Winchester.
Coleman, W. K., West Union.
Connell, W. R. S., Manchester.
Gaston, E. M., Tranquility.
Guthrie, J. W., Manchester.
Kirkpatrick, D. B., No. Liberty.
Lockhart, J. M., Eckmansville.
Sproull, O. T., Bentonville.
Stephenson, R. A., Manchester.
Stevenson, Titus, North Liberty.
Wittenmeyer, J. M., West Union.

ALLEN COUNTY MEDICAL SOCIETY

MEMBERS

Bates, F. L., Lima.
Bice, A. W., Lima.
Burton, E. G., Lima.
Collins, C. C., Lima.
Foltz, D. W., Lima.
Goehel, A. M., Lima.
Harper, W., Lima.
Hill, R. M. C., Huring P. O.
Hirn, S. B., Lima.
Hover, B. E., Lima.
Huntley, J., Lima.
Jones, A. L., Lima.
Landich, L. F., Lima
McColl, E. E., Lima.
Mumaugh, S. S., Lima.
Parent, W. H., Lima.
Rudy, A. S., Lima.
Steiner, D. W., Lima.
Steuber, F. G., Lima.
Steuber, L. J., Lima.
Terwilliger, T. R., Lima.
Vail, J. B., Lima.
Van Note, W. B., Lima.
Weadock, T. M., Lima.

ASHTABULA, LAKE AND GEAUGA MEDICAL SOCIETY

Auxiliary since 1896 Annual Meeting in January

W. S. Weiss.....President.
D. B. Aldrich.....1st Vice President.
F. W. Fisher.....2nd Vice President.
F. D. Case.....Secretary and Treasurer.

MEMBERS

Aldrich, D. B., Ashtabula.
Amidon, H. N., Painesville.
Anderson, G. S., Andover.
Baker, C. D., Conneaut.
Battles, Mary, Ashtabula.
Baxter, R. J., Conneaut.
Blakeslee, O. O., Conneaut.
Block, J. M., Montville.
Bollard, G. D., Jefferson.
Burrows, S. S., Geneva.
Buys, Frank, Painesville.
Case, Clarence E., Ashtabula.
Case, F. D., Ashtabula.
Clark, F. R., Trumbull.
Cossitt, D. S., Conneaut.
Dickson, J. A., Ashtabula.
Dorman, H. W., Ashtabula.
Edwards, P. J., Huntsburg.
Ellsworth, W. O., Austinburg.
Fisher, F. W., Ashtabula.
Flower, W. R., Ashtabula.
Fox, C. L., Kingsville.
Gilchrist, W. L., Ashtabula.
Graham, J. M., Williamsfield.
Grover, C. T., Orwell.
Hogan, J. J., Ashtabula.
Hopkins, A. W., Ashtabula.
Houghtaling, F. M., Austinburg.
House, C. H., Painesville.
King, W. S., Ashtabula.
Leet, Wm., Conneaut.
Merriam, E. D., Conneaut.
Merriman, D. J., Painesville.
Osborn, H. M., Kellogsville.
Palmer, D. G., Geneva.
Pomeroy, A. L., Windsor.
Pomeroy, O., Chardon.
Quayle, C. H., Madison.
Robinson, O. C., Windsor.
Shaefer, J. A., Ashtabula.
Shalto, H. J,, Colebrook.
Snyder, F. D., Ashtabula.
Tower, B. M., Conneaut.
Upson, F. W., Conneaut.
Warner, A. D., Burton.
Webster, G. E., Kingsville.
Weiss, W. L., Rock Creek.
Whitsey, H. E., Ashtabula.
Wilson, H., Conneaut.

BELMONT COUNTY MEDICAL SOCIETY

Auxiliary since 1887 Annual Meeting in December.

J. W. Howells.....President, Bridgeport.
A. H. Hewetson.....Vice-President.
A. J. Heinlein.....Treasurer.
Board of Censors—J. P. West, C. C. Cole, A. C. Beetham, A. J. Hobson, B. O. Williams.

MEMBERS

Beetham, A. C., Bellaire.
Berry, Jacob, Alledonia.
Black, O. J., Bridgeport.
Blackford, J. M., Martins Ferry.
Boone, D. W., Bellaire.
Boone, J. S., Powhatan.
Calhoun, G. E., Maynard.
Clark, J. A., Glencoe.
Cole, C. C., Bridgeport.
Cooper, J. W., Bellaire.
Cope, E. C., Cope,
Diven, A. W., Martins Ferry.
Drennen, J. N., Loydsville.
Ely, J. S., Barnesville.
Gregg, S. T., Belmont.
Hawthorn, E. L., Colerain.
Heinlein, A. J., Bridgeport.
Hewetson, A. H., St. Clairsville.
Hobson, A. B., Flushing.
Hobson, J. A., Flushing.
Howells, J. W., Bridgeport.
Judkins, W. L., Barnesville.
Korner, A. H., Woodsfield.
Korrell, F. A., Key.
McClellan, J. S., Bellaire.
McClester, J. C., Harrisville.
McDonald, J. W., Benwood, W. Va.
Minesinger, J. L., Bellaire.
Morrison, Paul, Martins Ferry.
Ong, A. R., Martins Ferry.
Parry, J. R., Woodsfield.
Phillips, D. F., Morristown.
Piersol, Joseph, Bellaire.
Piper, Wm., Bellaire.
Riggs, E. N., Powhatan.
Thompson, W. E., St. Clairsville.
Webster, J. V., Flushing.
West, H. S., St. Clairsville.
West, J. P., Bellaire.
West, S. L., St. Clairsville.
Williams, B. O., Martins Ferry.
Workman, J. C., Uniontown.

BROWN COUNTY MEDICAL SOCIETY

Thos. W. Gordon.....President.
W. A. Dixon.....Vice President.
Y. Stephenson .....Treasurer.
Lee Markley.....Secretary.

MEMBERS

Beck, I. N., Hon., Sardinia.
Bivans, W. A., New Hope.
Dixon, W. A., Ripley.
Francis, A. W., Ripley.
Gilfillen, A., Russelville.
Gordon, Thos. W., Georgetown.
Heaton, T., Aberdeen.
Kautz, Jas. W., Arnheim.
Love, E. W., Fayetteville.
Markley, Lee, Georgetown.
McCall, R. B., Hamersville.
McLain, J. B., Sardinia.
Sheldon, S. B., Five Mile.
Stephenson, Y., Georgetown.
Tyler, Geo. P., Ripley.

BUTLER COUNTY MEDICAL SOCIETY

Auxiliary since 1852 Annual Meeting in January.

F. M. Barden.....President.
J. H. Roll.....Vice-President.
Aug. Schumacher.....Secretary.
F. M. Fitton.....Treasurer.

MEMBERS

Abbott, E. H., Summerville.
Alexander, W. S., Oxford.
Barden, F. M., Hamilton.
Brown, Walter, Hamilton.
Bundy, D. B., Middletown.
Carson, O. M., Middletown.
Cherryholmes, W. K., Hamilton.
Cook, Geo. F., Oxford.
Dickey, T. A., Middletown.
Fitton, F. M., Hamilton.
Fitzpatrick, T. V., Cincinnati.
Francis, John, Hamilton.
Grafft, James, Trenton.
Grafft, John, Hamilton.
Hancock, W. D., Millville.
Hermann, G. A., Hamilton.
Hill, Ed. L., Oxford.
Hincklev, H. D., Cincinnati.
Hornung, F. G., Hamilton.
Huston, Chas. N., Hamilton.
Huston, Wm. C., Hamilton.
Jacobs, M. M., Hamilton.
Long, James, Millville.
Lummis, Geo. D., Middletown.
Macready, James, Monroe.
Mallory, Henry, Hamilton.
Mayer, O. W., Hamilton.
Millikin, Dan, Hamilton.
Millikin, Mark, Hamilton.
Owsley, J. B., Jacksonburg.
Reed, C. A. L., Cincinnati.
Reed, W. S., Stockton.
Roll, J. H., Hamilton.
Scheel, J. O., Hamilton.
Schaefer, C. A., Darrtown.
Schumacher, Aug., Hamilton.
Sharkey, Thos. D., Hamilton.
Sul, E. C., Hamilton.
Skinner, G. C., Hamilton.
Smedley, A. L., Hamilton.
Smith, H. S., Middletown.
Torrence, J. E., Oxford.
Twitchell, Herbert, Hamilton.
Urmston, Wm. B., Chicago, Ill.
Wasson, C. C., Hamilton.
Weston, A. J., Clawson.

CENTRAL OHIO MEDICAL SOCIETY

R. H. Henry.....President.
J. A. Linebaugh.....Vice-President.
Edgar M. Hatton .....Secretary.
W. H. H. Nash.....Treasurer.

MEMBERS

Baldwin, J. F.
Barnhill, J. U.
Beery, J. E.
Bishop, J. C.
Blake, F. W.
Blake, W. H.
Blesch, P. S.
Bowen, A. H.

Brown, J. E.
Clark, C. F.
Clouse, C. M.
Cooper, A.
Davidson, N. P.
Dennison, A. M.
Dumm, S. C.
Emerick, E. J.
Evans, A. E.
Follett, A.
Fraker, H. C.
Frankenburg, O.
Fullerton, E. B.
Gay, N.
Gilliam, E. M.
Green, W. J.
Guerin, Z. F.
Gunsaulus, F.
Hamilton, C. H.
Hamilton, W. D.
Hatton, Edgar M.
Havens, W. V.
Hendrixson, Hugh.
Hendrixson, Ora S.
Henry, R. H.
Hoover, L. S.
Hoover, T. C.
Hyatt, E. H.
Jenkins, N. J.
Jewett, S. V.
Johnson, Alice M.
Jones, T. W.
Jones, A. W.
Kinsman, D. N.
Landon, C. P.
Lawrence, F. F.
Lawrence, J. C.
Leeper, J. A.
Linebaugh, J. A.
Loving, S.
McIntire, William.
Means, W. J.
Mills, J. T.
Montgomery, C. R.
Moore, Dickson L.
Nash, W. H. H.
Overly, J. E.
Pinkerton, W. S.
Probst, C. O.
Rankin, T. W.
Reed, R. Harvey.
Richards, S. S.
Richardson, A. B.
Ricketts, B. Merrill.
Ritter, A. S.
Ross, C. C.
Schueller, J. B.
Sharp, A.
Sharp, H. J.
Stein, G. C.
Stritmather, Lucy L.
Taylor, S. B.
Thomas, F. W.
Turney, F.
Warner, F.
Whitaker, H. W.
Wilson, E. J.
Wirth, R.
Woodruff, L.
Wright, J. W.

CHAMPAIGN COUNTY MEDICAL SOCIETY

Auxiliary since 1879 — Annual Meeting in April

S. M. Mosgrove.....President.
F. S. Thomson.....Vice-President.
E. W. Ludlow.....Secretary.
D. O. Brine.....Treasurer.
J. V. Longfellow.....Librarian.
Censors—M. L. Smith, D. R. Emmons, H. M. Pearce.

MEMBERS

Baker, B. F., St. Paris.
Brine, D. O., Urbana.
Carter, J. S., Urbana.
Clark, J. H., Mechanicsburg.
Demand, C. E., Mechanicsburg.
Emmons, D. R., No. Lewisburg.
Henderson, R., Urbana.
Hunt, H. B., St. Paris.
Leonard, B. B., West Liberty.
Longfellow, J. V., Urbana.
Ludlow, E. W., Urbana.
McLaughlin, C. M., Westville.
Mosgrove, J. M., Urbana.
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Jones, R. C., 2373 Park.
Jones, W. E., 911 E. McMillan.
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Dickenson, J., 32 Sibley.
Dutton, C. F., 122 Euclid.
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Esch, W. J., 679 St. Clair.
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Fortlage, H., 451 Pearl.
Foshay, P. M., 89 Euclid.
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Franke, F. C., 701 Woodland.
Friedmann, I., 465 St. Clair.
Friedrich, M., The Osborne.
Fritch, J. C., 380 Pearl.
Frost, Geo. M., 137 Streator.
Fry, R. D., 176 Euclid.
Gallagher, J. V., 800 Superior.

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Goetz, F. E., 581 Woodland.
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Herrick, H. J., 365 Erie.
Herrick, H. J., Jr., 365 Erie.
Herrick, W. H., 176 Euclid.
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Holliday, W. W., 2588 Broadway.
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Kolb, M. G., 1007 Pearl.
Kopfstein, F. T., 2300 Superior.
Krebs, P. H., 1007 Pearl.
Large, S. H., 29 Euclid.
Lauder, E. S., The Osborne.
Lee, H. J., 71 Tilden.
Leick, Geo. F., 503 Prospect.
Lenker, J. N., The Osborne.
Lewis, J. M., 176 Euclid.
Lincoln, Walter, Osborne Bldg.
Lincoln, Wm. R., Osborne Bldg.
Loewenthal, M., 1200 Case.
Lower, W. E., Osborne Bldg.
Lowman, J. H., 441 Prospect.
Lucas, V. C., 1156 Pearl.
Lucas, W. H., 853 Lorain.
Luck, H. C., 122 Euclid.
Mabley, H. C., 2088 Euclid.
MacTaggart, R. G., 451 Pearl.
McGee, J. B., 1405 Woodland.
McNamara, A. J., 176 Euclid.
McQuiston, H., 19 Walker.
Martin, R. H., 389 Cedar.
Martin, T. C., 1077 Prospect.
Marvin, A. H., 106 Euclid.
Merriam, W. H., 62 Streator.
Miller, Amanda H., 997 Pearl.
Milliken, B. L., 278 Prospect.
Mizer, T. J., 797 Lorain.
Morton, F. J., 959 Lorain.
Mueller, O., 539 Pearl.
Mustard, J. W., 959 Willson.
Nelson, C. F., 27 Dorchester.
Nevison, W. H., 409 Prospect.
Nungesser, J. J., 97 Lyman.
Nydegger, R., 166 Jennings.
Ormsby, H. B., 249 Central.
Osborn, W. O., The Osborne.
Oster, L. W., 1234 St. Clair.
Parke, M. J., 337 Prospect.
Parker, C. B., 425 Euclid.
Paulin, N. O., 1232 Euclid.
Pav, Anton, 1574 Willson.

Payne, F. A., 616 Willson.
Pelton, R. P., 2016 Detroit.
Perrier, J., 1014 Willson.
Peskind, A., 1354 Willson.
Pipes, J. R., 429 Prospect.
Pollock, R., 747 Hough.
Powell, H. H., 467 Prospect.
Pressy, A. J., 900 Fairmount.
Quirk, H. W., 1232 Euclid.
Reich, L., 330 Woodland.
Rhodes, E. B., 3225 Euclid.
Riley, J. A., 1314 Cedar.
Robb, Hunter, 1342 Euclid.
Rogers, H. W., 128 Franklin.
Rose, E. J., 1216 Willson.
Rosenberg, E., 1597 Woodland.
Rosenwasser, M., 722 Woodland.
Rosewater, N., 846 Woodland.
Russell, G. C., 312 Prospect.
Sager, B. E., 243 Crawford.
Sawyer, J. P., 122 Euclid.
Sawyer, P. H., 54 Streator.
Scott, N. Stone, 531 Prospect.
Schmoldt, F. J., St. Alexis Hospital.
Sechrist, Cora, 176 Euclid.
Shackleton, W. E., 122 Euclid.
Sherman, H. G., 29 Euclid.
Shirkey, U. S. L., 1357 Lorain.
Siegelstein, L. E., 333 Woodland.
Simpson, A. J., St. Alexis Hospital.
Sipher, J. N., 76 Euclid.
Skeel, R. E., 1156 Pearl.
Smith, C. W., 122 Euclid.
Smith, D. B., Case Bldg.
Smith, G. S., 1273 Euclid.
Snow, L. B., 122 Euclid.
Sollman, T., W. R. U. Med. Coll.
Spence, H. L., 1160 E. Madison.
Spenzer, J. G., 341½ Prospect.
Spurney, A. F., 864 Woodland.
Steiner, A., 766 Woodland.
Stepp, M., 7 Minnesota.
Steuer, D. B., 465 St. Clair.
Steuer, J. C., 9½ Woodland.
Stevenson, G. W., 1439 Woodland.
Stewart, G. N., W. R. U. Med. Coll.
Stoskopf, Geo., 60 Professor.
Stotter, J., 176 Euclid.
Stovering, F. A., 176 Euclid.
Straight, H. S., 321 Hickox Bldg.
Stuart, C. C., 408 Jennings.
Sykora, J., 1449 Broadway.
Taylor, F. C., 128 Franklin.
Thoburn, H. T., 477 Prospect.
Thomas, J. J., 665 Hough.
Thomas, O. T., 763 Scranton.
Towslee, L. G., 407 Osborne Bldg.
Tuckerman, L. B., 298 Central.
Turner, C. A., 80 Euclid.
Upson, G. D., 302 Hickox Bldg.
Upson, H. S., 514 New England Bldg.
Vincent, H. D., 499 Pearl.
Wagner, H. G., 10 Granger.
Warner, W. C., 739 Hough.
Watson, G. N., 1863 Pearl.
Weber, W. C., 405 Prospect.
Welty, C. F., The Osborn.
Wenner, R. J., 137 Handy.
Wheatley, Wm. E., 35 Wabash.
White, D. K., Osborne Bldg.
Williams, T. B., 145 Quincy.
Wirt, W. E., 477 Prospect.
Wooldridge, C. W., 933½ Woodland.
Yarian, N. C., 1135 Detroit.

NONRESIDENT MEMBERS

Adams, C. W., Jefferson.
Arner, A. L., Jefferson.
Amidon, H. N., Painesville.
Ballard, H. C., Columbiana.
Bauer, M. M., Lake.
Beach, A. M., Niles.
Bell, W. H., Bellevue.
Berneike, R. A., Collinwood.
Booth, Chas. C., Youngstown.
Bourn, E. L., Brecksville.
Boyd, Jas. P., Akron.
Bozovsky, V. D., Monroeville.
Brant, A. C., Canton.
Breck, T. B., Hudson.
Breck, Theodore, Brecksville.
Bunce, W. C., Oberlin.
Burrows, S. S., Geneva.
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Carpenter, E. G., Columbus.
Chakijian, H. K., Chicago, Ill.
Chamberlin, W. E., Akron.
Chapman, Byron, Copley.
Clark, A. M., Youngstown.
Clark, E. A., Willoughby.
Cleaver, J. V., Akron.
Coates, F. M., Berea.
Cox, S. S., Lorain.
Craig, J. Harvey, Mansfield.
Dickson, J. S., Ashtabula.
Dotterweich, F. V., Ashland.
Eldridge, F. A., Berlin Heights.
Ellsworth, W. O., Austinburg.
Engleby, F. E., Vermillion.
Everhard, N. S., Wadsworth.
Falor, O. N., North Baltimore.
Feister, H. A., Jr., Newton Falls.
Fox, C. L., Kingsville.
Fraunfelter, Jas., Canton.
Gamble, R. V., New London.
Gardner, D. S., Massillon.
Gardner, J. F., West Brookfield.
Garver, A. N., Lorain.
Gibson, R. D., Youngstown.
Gill, G., N. Ridgeville.
Glass, G. F., Collamer.
Goodwin, E. M., Glenville.
Gunsolly, W. N., Collinwood.
Hall, H. L., North Amherst.
Handler, S., 670 N. St. Paul, Rochester, N. Y.
Hanna, D., Oberlin.
Hannum, E. S., Mantua Station.
Harmon, J. D., Warren.
Haskins, H. D., Strongsville.
Hawley, E. N., Norwalk.
Haynes, J. T., Sandusky.
Hiddleson, C. S., Atwater.
Hill, E. W., Glenville.
Hine, G. W., Berlin Heights.
Hitchcock, E., Akron.
Hobson, J. F., Lakewood.
Hoover, D. E., Warren.
Hopkins, A. W., Ashtabula.
Howard, A. B., Cuyahoga Falls.
Humphrey, C. M., Akron.
Hutton, C. F. Minerva.
Ingersoll, A. J., Mentor.
Jacobs, H. H., Akron.
Jacobs, W. C., Akron.
Jameson, G. C., Oberlin.
Johnson, Wm. H., Collins.
Jones, A. W., Lakewood.
Jones, Dallas K., Canal Fulton.
Jones, D. W., Girard.
Kinnaman, R. C., Ashland.
Lanterman, G. S., Bellevue.
Lathrop, G. C., Dover.
Leet, W. H., Conneaut.
Leitch, A. J., Niles.
Leonard, F. E., Oberlin.
Leonard, W. W., Akron.
Leroy, B. R., Chagrin Falls.
Linden, W. E., South Brooklyn.
Loney, D. W., Olena.

Love, M. J., Bloomingville.
Lowe, J. W., Mentor.
Mantley, Chas., Minerva.
Maynard, O. T., Elyria.
McConkey, W. J., Canton.
McVeigh, J. A., Detroit, Mich.
Merriman, D. J., Painesville.
Miller, M. F., Wadsworth.
Miner, A. G., Niles.
Myers, I. A., Shelby.
Nachtigall, J. A. B., Germany.
Newcomb, Elizabeth, Oberlin.
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Oakes, I. N., N. Ridgeville.
Oettinger, B., Denver, Col.
Ohlmacher, A. P., Gallipolis.
Oviatt, W. H., Canal Dover.
Page, H. M., Hiram.
Perkins, D. S., Denver, Col.
Power, H. W., Amherst.
Rogers, J. H., Louisville.
Rhu, Aug., Marion.
Ruedy, R. E., Columbus.
Sabin, T. M., Warren.
Sadler, L. A., Washington, D. C.
Schilling, Chas. E., Canton.
Searl, W. A., Cuyahoga Falls.
Seidell, R. R., Bedford.
Shane, G. A., Waynesburgh.
Smith, F. K., Warren.
Smith, W. H., Akron.
Smith, J. T., Collinwood.
Snow, Chas. A., Garrettsville.
Snyder, G. N., La Grange.
Stamm, M., Fremont.
Starr, G. L., Hudson.
Stoll, C. W., Dover.
Tanner, C. H., Willoughby.
Tidball, A. H., Garrettsville.
Tower, B. M., Conneaut.
Tuttle, Carl, Berlin Heights.
Tressel, J. H., Alliance.
Tripp, Q. A., Nottingham.
Upson, F. W., Conneaut.
Walker, A. B., Canton.
Ward, C. S., Warren.
Ward, W. A., Conneaut.
Weedman, C., Nova.
Wenner, H. L., Tiffin.
Whelan, R. E., Youngstown.
White, W. W., Ravenna.
Wood, J. S., Collinwood.
Woodward, R. M., M. H. S. Reedy Island Quarantine, Del.
Wright, S. J., Tallmadge.
Young, D. H., Chicago, Ohio.
Zimmerman, H. O., Youngstown.

CLINTON COUNTY MEDICAL SOCIETY

Auxiliary since 1879 — Annual Meeting in May

G. W. Wire.....President.
E. Briggs.....Secretary.
N. B. Van Winkle.....Treasurer.

MEMBERS

Adams, C. F., Milledgeville.
Austin, G. M., Wilmington.
Briggs, E., Wilmington.
Conard, G. M., New Vienna.
Donaldson, J. F., Bowersville.
Garland, Z. T., Clarksville.
Hale, D. B., Wilmington.
Lightner, Frank, Sabina.
Lightner, S. B., Sabina.
McKechnie, J. B., Cincinnati.

Mory, D. B., Sr., Wilmington.
Mory, D. B., Jr., Wilmington.
Moon, A. B., Wilmington.
Quinn, A. T., Wilmington.
Quinn, T. C., New Vienna.
Savage, T. J., Bowersville.
Smith, S., Lumberton.
Snook, C. W., Clarksville.
Telfair, G. M., Bloomington.
Tribbett, C. A., Westboro.
Trimble, R. T., New Vienna.
Van Winkle, N. B., Blanchester.
Welch, Charles, Wilmington.
Whistler, H., New Antioch.
Wilkinson, M., Sabina.
Wire, G. W., Wilmington.
Wood, Charles, Clarksville.

COLUMBUS ACADEMY OF MEDICINE

C. S. Hamilton.....President.
Andrew Timberman.....Vice-President.
F. W. Blake.....Treasurer.
Wm. D. Deuschle.....Secretary.

MEMBERS

Baldwin, J. F.
Barkley, M. A.
Barnhill, J. U.
Beery, J. E.
Bethauser, C. M.
Blackburn, M. E.
Blake, F. W.
Bleile, A. M.
Bonnet, A. O.
Bowen, A. H.
Brown, J. E.
Burgoyne, J. A.
Carter, C. C.
Chapman, L. J.
Clark, C. F.
Clouse, G. M.
Cole, W. N.
Coleman, N. R.
Collison, F. J.
Combs, R. D.
Cooper, Albert.
Cooperrider, C. A.
Davenport, A. B.
Deuschle, Wm. D.
Dick, W. L.
Dixon M. T.
Dumm, S. C.
Dunham, J. D.
Dunham, J. M.
Early, L. M.
Edmiston, W. E.
Emerick, E. J.
Evans, A. E.
Fraker, H. C.
Frame, J. A.
Frankenberg, O.
Fullerton, E. B.
Gilliam, D. Tod.
Gilliam, E. M.
Gordon, J. L.
Griffin, A. E.
Hamilton, C. S.
Hamilton, W. D.
Harris, H. L.
Hatton, E. M.
Havens, W. V.
Hendrixson, H.
Hendrixson, O. P.
Henry, R. H.
Herbst, E.
Hoover, T. C.
Johnson, Alice M.
Jones, H. S.
Kahn, Louis.

Kinsman, D. N.
Landon, C. P.
Lawrence, F. F.
Lawrence, J. C.
Linebaugh, J. A.
Linhart, C. P.
Lippitt, B. F.
Lippitt, T. M.
Loving, Starling.
Marshall, G. M.
McCafferty, Frank.
McClure, J. A.
Means, C. S.
Moore, D. L.
Moore, H. M. W.
Murphy, J. A.
Nash, W. H. H.
Park, James.
Parker, C. A.
Platter, H. M.
Probst, C. O.
Rankin, T. W.
Rogers, W. K.
Ross, C. C.
Rukenbrod, E. P.
Shepherd, C. J.
Shriner, P. D.
Spohr, Carl.
Stein, G. S.
Steinfeld, A. M.
Stillman, F. L.
Stockton, Geo.
Stout, J. A.
Taylor, C. M.
Taylor S. B.
Timberman, Andrew.
Turney, C. F.
Upham, J. H.
Van Fossen, J. A.
Wardlow, Y.
Warner, Frank.
Waters, G. M.
Westervelt, W. A
Whitaker, H. W.
Whitehead, H.
Whitten, W. F.
Wilcox, S. S.
Wilson, E. F.
Wilson, E. J.
Wilson, Ida M.
Winders, Frank.
Wissinger, T. K.
Wolfe, A. C.
Woodruff, E. W.
Youmans, T. G.

CRAWFORD COUNTY MEDICAL SOCIETY

Auxiliary since 1893 — Annual Meeting in April

A. M. Duncan.....President.
J. Bland .....Vice-President.
L. Kemp .....Secretary.
F. M. Virtue.....Treasurer.

MEMBERS

Baker, C. L., Kirkpatrick.
Bevington, H. S., Sulphur Spr'gs.
Blair, G. O.. Leesville.
Bland, J., Bucyrus.
Chesney, J. A., Bucyrus.
Duncan, A. M., Bucyrus.
Fitzsimmons, J. F., Bucyrus.
Guiss, W. H., Tyro.
Kelly, W .J., Galion.
Kemp, Lucia, Bucyrus.
King, J. I., Martel.
McLeod, C. H., Chatfield.
Moses, J. B., Crestline.
Ott, W. G., New Winchester.
Ridgeway, N. B., Galion.
Trimble, C. E., Crestline.
Van Natta, H. L., Seal.
Virtue, D. B., Lykens.
Virtue, F. M., Sulphur Springs.

CUYAHOGA COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Annual Meeting in April

F. E. Bunts.....President.
C. J. Aldrich.....1st Vice-President.
H. W. Rogers.....2d Vice-President.
Chas. C. Stuart.....Secretary.
L. S. Chadwick.....Treasurer.

Censors—J. P. Sawyer, W. T. Corlett, H. J. Lee.

Trustees—J. D. Jones, ('03); P. H. Sawyer, ('00); H. E. Handerson, ('01); A. G. Hart, ('02); W. A. Knowlton, ('03).

Honorary Members—Dr. Martin Luther Brooks, 289 Prospect Street; Dr. Henry Kirke Cushing, 967 Prospect Street; Dr. G. C. E. Weber, Nuremberg, Germany, F. K. Smith, Warren, O.

MEMBERS

Albl, Michael A., 1464 Broadway.
Aldrich, Charles J., 744 Prospect.
Allen, Dudley P., 278 Prospect.
Arms, Charles C., 1213 New England Bldg.
Ashmun, George C., 794 Republic.
Baker, Albert R., 122 Euclid.
Baker, Cornelius, 553 Kinsman.
Becker, H. A., 1207 Pearl.
Biggar, H. F., Jr., 166 Euclid.
Boggs, Jessie, 1257 Euclid.
Brashear, Basil B., 251 St. Clair.
Brockett, Andrew J., 32 Hawthorne.
Bunts, Frank E., 275 Prospect.
Burdick, Halbert J., 519 Cedar.
Burton, Erasmus D., East Cleveland.
Campbell, Oscar B., 993 Cedar.
Carlisle, Irwin C., Doan st., Glenville.
Chadwick, Leroy S., 1824 Euclid.
Coates, B. O.
Corlett, William T., 553 Euclid.
Cotton, Clyde E., 350 Jennings.
Crile, Geo. W., 275 Prospect.
Cushing, Edward F., 967 Prospect.
Dutton, Chas. F., 122 Euclid.
Eyman, Henry C., Cleveland State Hospital.
Foote, C. G., 961 Prospect.
Fraser, John M., 950 Cedar.
Gentsch, Chas., 167 Franklin.
Handerson, Henry E., 444 Dunham.
Hanson, David S., 1419 Broadway.
Hart, Albert G., 102 Jennings.
Herrick, Henry B., 2228 Euclid.
Herrick, Henry J., 367 Erie.
Hintzelman, Chas., 86 Randall.
Hobson, John F., Lakewood, O.
Holiday, Benjamin W., 520 Prospect.
Holliday, William W., 2588 Broadway.
Hoover, Charles F., 282 Prospect.

Howard, William T., Jr., W. R. U. Medical College.
James, William S., 1519½ Lorain.
Jenks, William O., Nottingham.
Jones, John D., 1631 Harvard.
Kaestlen, Samuel E., 615 Lorain.
Kelly, Samuel W., 1150 Superior.
Kerruish, Miriam G., 1273 Euclid.
Knowlton, William A., 530 Jennings.
Kolb, Matthew G., 1007 Pearl.
Krause, Bernhard, 1465 Willson.
Lee, Howard J., 71 Tilden.
Leick, George F., 503 Prospect.
Lincoln, Wm., 275 Prospect.
Linden, Wm. E., S. Brooklyn, O.
Lower, Wm. E., 275 Prospect.
Lowman, John H., 441 Prospect.
Martin, T. C., 1077 Prospect.
Marvin, Albert H., 106 Euclid.
McGee, John B., 1405 Woodland.
McMichael, J. C., cor. Doan and St. Clair, Glenville, O.
McNamara, A. J., 504 Permanent Bldg.
McQuiston, Henry, 19 Walker.
Millikin, Benjamin L., 278 Prospect.
Morton, Fayette J., 959 Lorain.
Nevison, Wm. H., 278 Prospect.
Norton, Francis B., 19 Miles.
Oster, Louis W., 1234 St. Clair.
Oswald, Benjamin F., 2010 Detroit.
Parker, Chas. B., 425 Euclid.
Payne, Frank A., 89 Quinby.
Perkins, David S., 1273 Euclid.
Perrier, John, 1014 Willson.
Peskind, Arnold, 1354 Willson.
Powell, Hunter H., 467 Prospect.
Quirk, Howard W., 1232 Euclid.
Reich, Leo, cor. Scoville and Beech.
Robb, Hunter, 1342 Euclid.
Rogers, Henry W., cor. Pearl and Franklin.
Russell, George C., 312 Prospect.
Sager, B. E., 243 Crawford rd.
Sawyer, John P., 122 Euclid.
Sawyer, Pascal H., 54 Streator.
Scott, N. Stone, 531 Prospect.
Shackleton, W. E., 122 Euclid.
Sherman, Harris G., 29 Euclid.
Sipher, J. N., 76 Euclid.
Skeel, Roland E.. 1156 Pearl.
Smith, Charles W., 122 Euclid.
Snow, Lexor B., 158 Lincoln.
Somerville, George H., 2549 Broadway.
Spenzer, John G., 370 Central.
Stepp, Morris D., 7 Minnesota.
Stevenson, George W., 1439 Woodland.
Stillman, George B., 1318 Cedar.
Straight, Howard S., 323 Hickox Bldg.
Stuart, Chas. C., 408 Jennings.
Sykora, Joseph, 1449 Broadway.
Tuckerman, L. B., 298 Central.
Watson, George N., 1863 Pearl.
Weber, William C., 405 Prospect.
Wheatley, Wm. E., 35 Wabash.
White, D. K., 275 Prospect.
Woodbridge, J. E., 637 Prospect.

DEFIANCE COUNTY MEDICAL SOCIETY

Auxiliary since 1897

J. D. Westrick.....President.
M. B. Stevens.....Vice-President.
G. W. Huffman.....Secretary and Treasurer.

MEMBERS

Aldrich, P. H., Defiance.
Belau, Nettie, Defiance.
Coombs, J. M., Hicksville.
Coy, M. C., Stryker.
Denman, J. K., The Bend
Finch, R. W., Defiance.
Hoover, Kate, Defiance.
Huffman, G. W., Defiance.
Kinmont, T. C., Hicksville.
Lindersmith, H. C., Sherwood.
Powell, W. S., Defiance.
Replogle, M. V., Evansport.
Reynolds, J. J., Defiance.
Slocum, Chas. E., Defiance.
Stevens, M. B., Defiance.
Thacker, L. G., Defiance.
Westrick, J. D., Defiance.

DELAWARE COUNTY MEDICAL SOCIETY.

Auxiliary since 1898

W. B. Hedges .....President.
W. M. T. S. Simms.....Vice-President.
J. B. Woodworth.....Secretary.
C. W. Chidister .....Treasurer.
W. H. Woodworth.....Librarian.

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Andrus, H. F., Constantia.
Bonner, O. W., Delaware.
Bessie, Henry, Delaware.
Chidester, C. W., Delaware.
Cowls, G. E., Ostrander.
Crickard, W. F., Delaware.
Fay, D. C., Ostrander.
Fowler, W. S., Delaware.
Gage, F. L., Delaware.
Hedges, W. B., Delaware.
Hughes, D. E., Delaware.
James, J. K., Delaware.
Kerney, C. E., Delaware.
McCann, J., Delaware.
McIntyre, Wm., Warrensburg.
Murray, F. M., Delaware.
Ropp, W. T., Delaware.
Semans, E. M., Delaware.
Semans, W. M., Delaware.
Sims, W. M. T. S., Lewis Center.
Stickney, F. A., Kilbourne.
Talley, C. E., Powell.
Watts, J. W., Delaware.
Welch, Calvin, Delaware.
Westbrook, A. E., Ashley.
Willey, A. J., Delaware.
Willey, P. W., Lewis Center.
Woodworth, J. B., Delaware.
Woodworth, W. H., Delaware.

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W. S. Spence.....Vice-President.
W. O. Howells.....Vice-President.
Jas. T. Elliott.....Vice-President.
W. L. Carroll .....Vice-President.
J. C. M. Floyd.....Cor. Sec'y & Treas.
J. F. Purviance.....Rec. Sec'y.

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Andrews, R., East Liverpool.
Bailey, W. N., East Liverpool.
Barkhurst, S. O., Smithfield.
Blazer, H. E., Salineville.
Bozman, H. E., New Alexandria.
Calhoun, W. M., East Liverpool.
Campbell, J. S., Wellsville.
Carroll, W. L., Toronto.
Clark, W. R., East Liverpool.
Cole, C. C., Bridgeport.
Collins, B. F., Youngstown.
Collins, J. W., Toronto.
Colville, G. H., Harrisville.
Cooper, J. W., Bellaire.
Diven, A. W., Martins Ferry.
Elliott, A. A., Steubenville.
Elliott, Jas. T., East Liverpool.
England, W. L., Jewett.
Erskine, E. D., Steubenville.
Fisher, B. H., Steubenville.
Floyd, J. C. M., Steubenville.
Gardner, J. W., East Liverpool.
Gregg, M., Knoxville.
Groves, A. C., Jewett.
Hanna, J. F., Adena.
Hawthorne, E. S., Colerain.
Hewettson, A. H., St. Clairsville.
Hobbs, W. A., East Liverpool.
Hobson, J. A., Flushing.
Hoge, W. D., Portland Station.
Holland, A. B., Wellsville.
Howells, W. O., Bridgeport.
Huston, W. O., Bellaire.
Ikirt, Geo. P., East Liverpool.
Kerns, J. T. W., Bellaire.
Korner, A. H., Alledonia.
Laughlin, R., Steubenville.
Lemmon, L. A., Calcutta.
Lindsay, J. A., Salineville.
Marquis, Tom. B., Lisbon.
Marshall, R. J., East Liverpool.
Martin, J. W., Unionport.
McClellan, J. S., Bellaire.
McConnell, S. M., Wellsville.
McCoy, J. J., Steubenville.
McCullough, J. A., Steubenville.
McFarland, W. S., Wellsville.
McGavran, S. B., Cadiz.
McGlenn, J. A. Mt. Pleasant.
McMillen, W. W., Dillonvale.
Miller, J. E., Cadiz.
Minor, H. C., Toronto.
Nelson, H. W., Steubenville.
O'Connell, W. J., Mingo Junc.
Ong, A. R., Martins Ferry.
Parke, B. F., Wellsville.
Pearce, E., Steubenville.
Purviance, J. F., Steubenville.
Rea, E. H., Irondale.
Rex, Park., Wellsville.
Riggs, E. N., Powhattan.
Saint, J. N., East Liverpool.
Snyder, D. J., Scio.
Spence, W. S., Germano.
Stokes, W. H., Toronto.

Thompson, W., St. Clairsville.
Toot, Joseph, East Liverpool.
Watt, J. M., Toronto.
West, J. P., Bellaire.
Whittaker, J. F., Bloomingdale.
Williams, B. O., Martins Ferry.
Williams, L. O., East Liverpool.
Wood, W. H., Smithfield.
Young, J. P., Empire.

HONORARY MEMBERS

J. J. Buchanan, M. D., Pittsburg, Pa.
F. Savary Pearce, M. D., Philadelphia, Pa.
C. A. L. Reed, M. D., Cincinnati, O.
J.M. Swan, M. D., Canton, China.
S. L. Jepson, M. D., Wheeling, W. Va.

ERIE COUNTY MEDICAL SOCIETY

Auxiliary since 1877 Annual Meeting in April

Charles Graefe.....President.
J. T. Haynes.....Vice-President.
E. Stanley.....Vice-President.
A. F. Cook.....Secretary.

MEMBERS

Bigelow, G. J., Sandusky.
Buckingham, E. V., Chicago Junction.
Burnham, R. D Soldiers' Home.
Busch William H., Sandusky.
Cook, A. F., Sandusky.
De La Bare, Paul, Port Clinton.
Goodsell, E. J., Norwalk.
Graefe, Chas., Sandusky.
Graefe, William, Sandusky.
Haynes, J. T., Soldiers' Home.
Heiter, Karl, Sandusky.
Hessell. A. A., Bellevue.
Kreider, C. F., Monroeville.
Love, M. J., Bloomingville.
Merrill, A. E., Sandusky.
Merz, Chas. H., Sandusky.
Osborn, A. L., Norwalk.
Perkins, C. E., Sandusky.
Quigley, R. L., Vermillion.
Race, C. W., Soldiers' Home.
Sears, O. T., Put-in-Bay.
Shaffer, J. W., Sandusky.
Stanley, Ellwood, Sandusky.
Story, Wm., Castalia.
Sykes, R. D., Chicago Junction.
Tierney, Jno. Schell, Sandusky.
Waters, R. L., Lakeside.
Young, D. H., Chicago Junction.

GALLIA COUNTY MEDICAL SOCIETY

Auxiliary since 1895

E. G. Alcorn.....President.
J. Eakins.....Vice-President.
J. B. Alcorn.....Secretary.
L. B. Turner.....Treasurer.

MEMBERS

Alcorn, E. G., Gallipolis.
Alcorn, J. B., Gallipolis.
Bean, L. C., Gallipolis.
Cromley, F. A., Gallipolis.
Dustin, J. B., Vinton.
Eakins, J., Patriot.
Ely, Charles, Cheshire.
Ewing, G. K., Ewington.
Hamilton, H. M., Vinton.
Hanson, J. T., Gallipolis.
Jacobs, R. J., Vinton.
Miller, Wm., Thurman.
Parker, C. G., Gallipolis.
Parker, E. W., Gallipolis.
Strausbaugh, J. C., Vinton.
Turner, L. B., Bidwell.
Webster, D. J., Sand Fork.

GREENE COUNTY MEDICAL SOCIETY

Auxiliary since 1888 Annual Meeting in June

W. L. Rouse.....President.
D. E. Spahr.....Vice-President.
A. C. Messenger.....Secretary.
M. I. Marsh.....Treasurer.

MEMBERS

Anderson, George, Alpha.
Baldwin, J. W., Yellow Springs
Brown, R. L., New Jasper.
Brundage, A. H., Xenia.
Brundage, L. H., Xenia.
Carter, J. L., Selma.
Donaldson, D. F., Port William.
Donaldson. Frank, Port William.
Finley, W. H., Xenia.
Galloway, C. M., Xenia.
Galloway, W. A., Xenia.
Harris, J. H., Yellow Springs.
Harris, J. M., Yellow Springs.
Jones, L. M., Jamestown.
Kent, F. M., Spring Valley.
Lindsay, F. T., Xenia.
Marquart, O. M., Osborn.
Marsh, M. I., Cedarville.
McClellen, B. R., Xenia.
McClellen, H. R., Xenia.
Messenger, A. C., Xenia.
Murrel, Grant, New Burlington.
Ogan, F. W., Jamestown.
Prior, Amelia J., Xenia.
Rouse, W. L., Paintersville.
Sewell, S. G., New Burlington.
Smith, R. W., Spring Valley.
Spahr, D. E., Clifton.
Stewart, J. O., Cedarville.
Thompson, C. W., Cedarville.
Treherne, J. M., Zimmerman.
Wilson, S. S., Xenia.

HANCOCK COUNTY MEDICAL SOCIETY

Auxiliary since 1891

M. S. Williamson.....President.
T. S. Wilson.....Vice-President.
Don C. Hughes.....Secretary.
H. D. Belt.....Treasurer.

MEMBERS

Baker, J. P., Findlay.
Belt, H. D., Findlay.
Brayton, W. G., Fostoria.
Carrothers, M. M., Findlay.
Elwell, Wm., Van Buren.
Entrekin, F. B., Findlay.
Ewing, M. J., Findlay.
Firmin, F. W., Findlay.
Firmin, J. M., Findlay.
Herrington, S. G., Rawson.
Hersh, E. G., McComb.
Howell, J. A., McComb.
Hughes, D. C., Findlay.
Hurd, A., Findlay.
Kimmell, J. A., Findlay.
Martin, J. C., Findlay.
McGhee, W. C., Houcktown.
McLachlan, N. L., Findlay.
McLeod, J. R., Findlay.
Metzler, W. M., Vanlue.
Powell, J. E., Findlay.
Williamson, M. S., Findlay.
Wilson, T. S., Findlay.
Yost, W. N., Findlay.
Zopfi, W. J., Findlay.

HEMPSTEAD MEMORIAL ACADEMY OF MEDICINE

Auxiliary since 1885 — Annual Meeting in May

E. M. Foster.....President.
M. S. Pixley.....Secretary.
D. B. Cotton.....Treasurer.

MEMBERS

Allard, L. D., Portsmouth.
Andre, O. C., Waverly.
Berndt, A. D., Portsmouth.
Burgess, W. M., Portsmouth.
Campbell, A. D., Portsmouth.
Chabot, G. W., Otway.
Cotton, D. B., Portsmouth.
Cotton, Mary, Portsmouth.
Edwards, F. M., Portsmouth.
Foster, E. M., Portsmouth.
Frizella, J. S., Buena Vista.
Fulton, C. C., Portsmouth.
Gahm, J. L., Jackson.
Gordon, John F., Otway.
Halderman, S. S., Portsmouth.
Hall, Loren, Portsmouth.
Kline, P. J., Portsmouth.
Lottridge, W. M., Portsmouth.
McKerrichan, S. B., Portsmouth.
Marcum, L. D., Portsmouth.
Morgan, J. F., Jackson.
Osborne, G. W., Portsmouth.
Pixley, M. S., Portsmouth.
Rardin, J. S., Portsmouth.
Ray, J. B., Jr., Portsmouth.
Sellards, A. G., Portsmouth.
Smith, W. W., Portsmouth.
Taylor, James L., Wheelersburg.
Teachnor, Wells A., Sciotoville.
Titus, A., Portsmouth.
Vernier, L., Portsmouth.
Warwick, J. B., Lucasville.
Warwick, C. M., Lucasville.
Williams, J. B., Jackson.
Williams, F. H., Portsmouth.
Wiseman, J. S., Powellsville.

HIGHLAND COUNTY MEDICAL SOCIETY

President.....W. J. Strofe, Lynchburg.
Treasurer.....T. W. Roberts, Bell.
Secretary.....Lockhart Nelson, Hillsboro.

MEMBERS.

Beam, A. H., Sugartree Ridge.
Beeson, H. A., Leesburg.
Brown, H. M., 22 West 7th st., Cincinnati.
Chaney, S. F., Pricetown.
Conard, G. R., New Vienna.
Cornetet, E. W., Piketon.
Dunlap, R. S., Greenfield.
Duvall, T. W., Lynchburg.
Dwyer, R. A., New Petersburg.
Gibson, Jas. T., Lynchburg.
Glasgow, J. A., Bell.
Glenn, W. W., Hillsboro.
Granger, B. D., Hillsboro.
Granger, F. M., Russells.
Holmes, B. F., Hillsboro.
Holmes, R. E., Leesburg.
Holmes, T. H., Hillsboro.
Hook, O. C., Marshall.
Hopkins, O. A., Martinsville.
Jones, Robt. J., Greenfield.
Judkin, E. S., Highland.
Lafferty, N. B., Hillsboro.
Larkin, J. C., Hillsboro.
Leatherman, J. W., New Market.
Love, E. W., Fayettsville.
Matthews, J. W., Buford.
McBride, D. N., Rainsboro.
McCann, F. B., Greenfield.
McGarraugh, T. S., Greenfield.
McNulty, J. H., East Monroe.
Patterson, W. S., Hillsboro.
Quinn, Thos. C., New Vienna.
Russ, H. A., Hillsboro.
Scott, W. T., Martinsville.
Smith, C. B., Hillsboro.
Strofe, W. E., Lynchburg.
Thomas, F. M., Samantha.
Trimble, R. T., New Vienna.
Van Winkle, N. B., Blanchester.
Wilson, Frank L., Greenfield.
Wilson, W. H., Greenfield.
Wilson, W. H., Jr., Greenfield.

HOLMES COUNTY MEDICAL SOCIETY

F. J. Guittard.....President.
D. S. Olmstead.....Secretary.

MEMBERS

Bair, A. S., Winesburg.
Bigham, Jno. G., Millersburg.
Carson, F. D., Benton.
Crump, A. A., Jr., Millersburg.
Crump, A. A., Sr., Millersburg.
Cole, A. T., Millersburg.
Elder, W. T., Nashville.
Guittard, F. J., Charm.
Hoyer, A. M., Nashville.
Jones, A. L., Glenmont.
Jones, H. S., Clarks.
Jones, Jno. M., Glenmont.
Negelspach, Otto, Holmesville.
Olmstead, D. S., Millersburg.
Pomerene, H. P., Berlin.
Pomerene, Lister, Berlin.
Purdy, W. E., Killbuck.
Shalliol, Peter, Winesburg.
Snyder, S. P., New Bedford.
Starner, A. A., Mt. Hope.
Stuckey, A. J., Walnut Creek.
Whitmar, J. E., Millersburg.
Wilson, T. R., Clarks.
Wise, S. P., Millersburg.

JACKSON COUNTY MEDICAL SOCIETY

W. E. Williamson.....President.
J. E. Sylvester.....Vice-President.
D. B. Warren.....Treasurer.
W. R. Evans.....Secretary.

MEMBERS

Dando, E. T., Coalton.
Darling, G. W., Wellston.
Davis, D. W., Berlin X Roads.
Davis, Oscar, Oak Hill.
Drake, F. J., Leo.
Evans, W. R., Jackson.
Ewing, G. A., Jackson.
Gahm, J. L., Jackson.
Harbarger, G. H., Coalton.
Harbarger, J. W., Glen Roy.
Harrison, C. B., Wellston.
Hughs, E. E., Oak Hill.
Jacobs, Philander, Jackson.
Jones, E. J., Oak Hill.
Jones, G. E., Oak Hill.
Jones, R. J., Glen Roy.
Kinnison, Curtis, Limerick.
Kitchen, B. F., Wellston.
McClung, J. J., Glen Roy.
McLaughlin, Oscar, Remple.
Morgan, J. F., Jackson.
Plummer, F. E., Coalton.
Ray, A. G., Byer.
Ray, E. S., Hamden Junction.
Ray, J. H., Coalton.
Rogers, T. C., Wellston.
Sylvester, J. E., Wellston.
Warren, D. B., Wellston.
Williamson, W. E., Jackson.
Woodrow, O. M., Wellston.

JEFFERSON COUNTY MEDICAL SOCIETY

B. H. Fisher.....President, Steubenville.
A. A. Elliott.....Secretary.

MEMBERS

Blackburn, A. M., Steubenville.
Elliott, A. A., Steubenville.
Fisher, B. H., Steubenville.
Floyd, J. C. M., Steubenville.
Gregg, Melvin, Knoxville.
Nelson, H. H., Steubenville.
Pearce, E., Steubenville.
Whittaker, J. F., Bloomingdale.
Wood, W. H., Smithfield.

LUCAS COUNTY MEDICAL SOCIETY

Wm. Gillette.....President.
W. A. Dickey.....Vice-President.
J. A. Wright.....Recording Secretary.
G. F. Suker.....Financial Secretary.
D. E. Haag.....Treasurer.
Executive Committee—M. H. Bowman, P. H. Strausz, E. W. Heltman.

MEMBERS

Alter, F. W., 342 Summit.
Aftel, Gustav, Nebraska.
Baird, J. L., Lawrence and Bancroft.
Bamberger, H., 706 Stickney.
Barlow, E. B., 202 E. Bancroft.
Betts, Chas., Jefferson and 10th.
Bowman, D. E., Air Line Jct.
Bowman, M. H., Ashland and Floyd.
Brewer, L. A., 602 Virginia.
Burke, W. T., 47 Ontario.
Clark, D. J., Adams and Floyd.
Clark, J. F., Adams and Floyd.
Dickey, W. A., 227 12th.
Emery, Geo., Cherry and Erie.
Fella, I. J., Elm and Superior.
Gillette, Wm., 705 Madison.
Girardot, A. J., 1408 Cherry.
Green, H. L., 2404 Cherry.
Greenfield, E. J., Page and Franklin.
Grube, W. W., 1502 Collingwood.
Haag, D. E., 1121 Washington.
Heltman, E. W., Summit and Madison.
Henzler, Chas., 712 Bancroft.
Hobart, A. D., 500 Oak.
Howe, John, Vermont.
Jacobson, Julius, Franklin.
Jerome, M., Bancroft and Franklin.
Kimbell, O. W., 3111 Lagrange.
Kitchen, F. A., 2133 Jefferson.
Marshall, D. M., 145 Main.
McVety, Albert, 1440 Madison.
Michener, F. A., 131 12th.
Miller, C. S., 2424 Cherry.
Mills, C. H., 204 Fassett.
Minton, F. P., Valentine and Whitman.
Munn, H. E., 960 Broadway.
Newton, C. W., 309 Superior.
Noble, H. E., 440 E. Broadway.
Norris, W. L., Putnam and Woodruff.
North, John, Currier Bldg.
Reig, P., 338 Summit.
Schutt, L. C., 529 Mulberry.
Smead, H. E., 3131 Glenwood.
Snyder, W. H., 912 Jefferson.
Stewart, C. E., 221 16th.
Storz, C., 404 Nebraska.
Strausz, P. H., Hahtford Blk.
Suker, G. F., The Monticello.
Thorn, S. S., Lagrange and Superior.
Timpany R., Bancroft and Cherry
Walker, R. J., 637 Bridge.
Watson, J. L., Fulton and Prescott.
Wickham, W., Superior and Adams.
Wright, J. A., 1812 Cherry.
Young, N. H., Huron Blk.

MAHONING COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Annual Meeting in October

Harry E. Welch.....President.
Lebanon U. Howard.....Vice-President.
Raymond E. Whelan.....Secretary.
Robert D. Gibson.....Treasurer.
George S. Peck.....Librarian.
Censors—John J. Thomas, John MacCurdy, Arthur Winter.

MEMBERS

Arner, W. P., Fowler.
Barnes, R. H., Youngstown.
Beach, A. M., Niles.
Bennett, J. H., Youngtown.
Blott, H. E., Youngstown.
Booth, C. C., Youngstown.
Buechner, W. H., Youngstown.
Campbell, Daniel, Canfield.
Clark, A. M., Youngstown.
Clark, M. S., Youngstown.
Clarke, Ida, Youngstown.
Cone, J. E., Youngstown.
Crooks, J. H., Youngstown.
Dickson, J. A., Youngstown.
Floor, C. L., Youngstown.
Gibson, R. D., Youngstown.
Hahn, H. H., Youngstown.
Hauser, Chas., Youngstown.
Howard, L. U., Youngstown.
King, A. L., Youngstown.
Kotheimer, J. B., Youngstown.
Love, Wm. P., Youngstown.
MacCurdy, John, Youngstown.
Montgomery, R. H., Youngstown
Morrison, R. M., Youngstown.
Peck, G. S., Youngstown.
Thomas, J. J., Youngstown.
Vogan, J. E., Lowellville.
Warren, A. E., Youngstown.
Welch, H. E., Youngstown.
Werner, W. E., Austintown.
Whelan, R. E., Youngstown.
Whelan, W. J., Youngstown.
Wilson, A. C., Youngstown.
Winter, Arthur, Youngstown.
Woodbridge, J. E., Chicago, Ills.
Yost, J. O., Youngstown.
Zimmerman, H. A., Youngstown.
Zimmerman, J. S., Youngstown.

MANSFIELD ACADEMY OF MEDICINE

Auxiliary since 1897

John Maglott ..... President.
B. F. Harding ..... Secretary.

MEMBERS

Bowles, R. S.
Bushnell, William.
Davis, M. J.
Erwin, A. J.
Findley, Edwin.
Finley, Mary J.
Grubaugh, R. F.
Harding, B. F.
Harris, C. Jenner.
Hedges, J. S.
Kipp, A. E.
Loughridge, William.
Maglott, John.
McBride, J. Lillian.
McCullough, A. H.
Mitchell, George.
Stevens, J. L.
Stewart, J. S.
Wiles, Otis.

MARION COUNTY MEDICAL SOCIETY

Auxiliary since 1879 Annual Meeting in January

H. Chisholm ..... President.
A. Ogan ..... Vice-President.
R. Ramroth ..... Secretary.
O. W. Weeks ..... Treasurer.

MEMBERS

Britton, S. H., Adelaide.
Chisholm, Horatio, Marion.
Crane, A. M., Marion.
Denman, Wm. C., Marion.
Dombaugh, Robert S., Waldo.
Hamilton, L. D., Marion.
King, J. I., Martel.
McMurray, Jas. W., Marion.
Martin, Jno. T., Marion.
Ogan, A., Marion.
Ramroth, R., Marion.
Rhu, August, Marion.
Richardson, E. O., Marion.
Thomas, F. W., Marion.
Uhler, H. L., Marion.
Virden, J. E., Cochranton.
Weeks, D. O., Marion.
Weeks, O. W., Marion.

MEIGS COUNTY MEDICAL SOCIETY

Alice D. Williams.....President.
J. A. Miller.....1st Vice-President.
D. A. Sayre.....2d Vice-President.
D. Sisson.....Secretary and Treasurer.

MEMBERS

Bean, Geo., Rutland.
Crosbie, G. T., Carbon Hill.
Day, C. S., Harrisonville.
Day, H. C., Harrisonville.
Deem, S. P., Tuppera Plains.
Hartinger, D. B., Middleport.
Hoff, J. W., Pomeroy.
Holmes, A. F., Albany.
Hysell, J. H., Pomeroy.
Martin, W. H., Kingston.
Petty, C. W., Hartford City, W. Va.
Poindexter, Charles, Dexter.
Rathburn, D. C., Middleport.
Reed, C. R., Middleport.
Rine, E. W., Long Bottom.
Roush, L. F., New Haven.
Sayre, D. A., Hartford City, W. Va.
Stanley, A. A., Rutland.
Stobart, R. E., Pomeroy.
Swift, E. F., Pomeroy.
Thomas, L. A., Middleport.
Titus, J. M., Letart Falls.

MIAMI COUNTY MEDICAL SOCIETY

A. B. Frame.....President.
J. G. Senior.....Vice-President.
R. M. Shannon.....Recording Secretary.
H. H. Havens.....Corresponding Secretary.

MEMBERS

Ashton, A. S., Piqua.
Baker, J. H., Piqua.
Benson, C. B., Troy.
Bousman, A. J., Pleasant Hill.
Bousman, S. N., Pleasant Hill.
Coleman, W., Troy.
Deaton, Van S., Alcony.
Frame, A. B., Piqua.
Gabriel, J. F., Piqua.
Gennings, Gainor, West Milton.
Grosvenor, A. W., Piqua.
Hartman, S. D., Tippecanoe City.

Havens, H. H. Tippecanoe City.
Joe A. Hall, Troy.
Kessler, W. H., West Milton.
Kindell, Herbert, Covington.
Kitzmiller, F. E., Piqua.
Lowe, J. H., Piqua.
Mills, A. C., Covington.
O'Ferrall, R. M., Piqua.
Pearson, H. E., West Milton.
Rinehart, H. D., Covington.
Senour, J. G., Troy.
Shannon, R. M., Piqua.
Shellenberger, J. C., Piqua.
Thompson, W. R., Troy.
Tydings, O., Piqua.
Unkefer, W. N., Piqua.
Wright, T. M., Troy.

MIAMI VALLEY MEDICAL SOCIETY

President.....H. A. Beeson, Leesburg.
Vice-President.....J. S. Combs, Owensville.
Secretary.....S. Lambright, So. Lebanon.
Treasurer.....J. D. Wakefield, Loveland.
Censors—Leonard Mounts, Morrow; A. Morris, Goshen; R. B. Hall, Cincinnati.
Committee on Arrangements—Wm. Scott, Loveland.

MEMBERS

Anderson, F. M., Carthage.
Anderson, W. S., Newtonville.
Andrews, J. H., Goshen.
Ashburn, P. M., Cincinnati.
Asther, Geo. H., Elmwood Place.
Beckler, C. M., 805 Elm st., Cincinnati.
Beebe, B. F., 320 E. 4th, Cincinnati.
Beeson, H. A., Leesburg.
Belt, R. C., Milford.
Bettman, H. W., 547 W. 7th, Cincinnati.
Bishop, L. W., Loveland.
Bishop, N. W., Loveland.
Blair, B. H., Lebanon.
Bonar, J. I., 238 E. 4th, Cincinnati.
Bonifield, C. L., 432 W. 4th st., Cincinnati.
Boylan, J. E., 319 Broadway, Cincinnati.
Briggs, E., Wilmington.
Brown E. M., Amelia.
Brown, H. M., 22 W. 7th st., Cincinnati.
Brown, Jos. E., 1324 Race st., Cincinnati.
Carmichael, W. A., Loveland.
Clim, J. B., Perintown.
Clim, Galen L., Perintown.
Colter, L. S., Clifton and Prospect, Cincinnati.
Combs, J. S., Owensville.
Conard, Geo. R., New Vienna.
Couden, J. T., Morrow.
Culbertson, J. C., 317 W. 7th st., Cincinnati.
Cullen, G. I., 714 W. 6th st., Cincinnati.
Curry, F. C., Milford.
Evans, W. P., Miamiville.
Fisher, Herschel, Lebanon.
Fitzpatrick, T. V., 32 W. 8th st., Cincinnati.
French, E. H., Glendale.

Frost, Frank H., Lebanon.
Gatch, Con W., Milford.
Goode, Geo. H., 436 W. 7th st., Cincinnati.
Hall, Rufus B., 628 Elm st., Cincinnati.
Highlands, W. W., Newtown.
Hough, Chas. A., Lebanon.
Johnstone, A. W., Madisonville Road, Cincinnati.
Juettner, A. F., 1387 Ohio ave., Cincinnati.
Juettner, Otto, 1409 Elm st., Cincinnati.
Knight, A. L., Madisonville.
Kreiger, G. L., Madisonville.
Lambright, S., South Lebanon.
Langdon, F. W., 13 E. 7th st., Cincinnati.
Lyman, D. S., Goshen.
Macready, J. A., Monroe.
Marsh, F. O., 1616 Main st., Cincinnati.
Mitchell, E. W., Reading Road, Cincinnati.
Mitchell, T. A., Owensville.
Moore, J. W., Middletown.
Morris, A., Goshen.
Moss, W. F., Miamiville.
Mounts, J. L., Morrow.
Mounts, Leonard, Morrow.
Mullen, T. J., New Richmond.
Murphy, A. D., 109 W. 8th st., Cincinnati.
Oliver, J. C., 628 Elm st., Cincinnati.
Orr, Geo. B., 423 E. 4th st., Cincinnati.
Prugh, Geo. W., 2101 Eastern ave., Cincinnati.
Quinn, T. C., New Vienna.
Reamy, Thad. A., Oak st., Cincinnati.
Reed, Chas. A. L., St. Leger Pl., Cincinnati.
Ricketts, B. Merrill, 415 Broadway, Cincinnati.
Ricketts, Edwin S., 415 Broadway, Cincinnati.
Roberts, A. C., Morrow.
Romine, Maria M., Harveysburg.
Sandoe, J. L., Pearl and Butler sts., Cincinnati.
Scott, J. B., 1624 Western ave., Cincinnati.
Scott, N. I., Norwood.
Scott, Wm., Loveland.
Scoville, S. S., Lebanon.
Shields, E., 2008 Forum Road, Cincinnati.
Snider, Frank, Midland.
Snook, C. W., Clarksville.
Spence, A. D., Goshen.
Spence, C. J., 1036 Celestial st., Cincinnati.
Stevens, A. S., Kings Mills.
Stevens, E. S., Lebanon.
Strickler, Louis, 18 E. 8th st., Cincinnati.
Taylor, Wm. H., 533 W. 7th st., Cincinnati.
Techenor, E. J. Lebanon.
Thompson, J. A., 628 Elm st., Cincinnati.
Thorner, Max, 133 Garfield Place, Cincinnati.
Tribbel, C. A., Westboro.
Trimble, R. T., New Vienna.
Tufts, Chas. W., Hartwell.
Van Gundy, E. C., Midland.
Van Winkle, B. L., Blanchester.
Van Winkle, N. B., Blanchester.
Wakefield, J. D., Loveland.
Walker, E. W., 30 W. 8th st., Cincinnati.
Walton, L. A., Milford.
Whitacre, H. J., Auburn ave., Cincinnati.
Wire, G. W., Wilmington.
Zenner, Philip, Glenn Bldg., Cincinnati.
Zinke, E. Gustav., 13 Garfield Pl., Cincinnati.

MONTGOMERY COUNTY MEDICAL SOCIETY

W. J. Conklin.....President.
Webster S. Smith.....Secretary.
E. C. Davisson.....Vice-President.
D. C. Lichliter.....Treasurer.
Censors—George Goodhue, J. S. Beck, Horace Bonner.

MEMBERS

Bailey, V. M.
Baker, E. R.
Barker, F. D.
Barrere, D. M.
Bates, Albert L.
Beck, J. S.
Bohlender, E. E.
Bonner, Horace.
Boone, A.
Bridenbach, C. H.
Carter, J. L.
Conklin, W. J.
Crum, E. C.
Davisson, E. C.
Dolina, J. F.
Duckwall, Francis.
Dupuy, T. V.
Ellis, S. B.
Evans, Geo. B.
Farber, J. H.
Fife, Frank.
Gangler, R. S.
Geyer, John.
Good, Harman.
Goodhue, Geo.
Gray, F. C.
Greene, D. W.
Haning, H. C.
Hatcher, H. H.
Hecker, L. E.
Henry, F. R.
Hochwalt, G. A.
Hooven, W. E.
Hous, G. W.
Huffman, D. C.
Humphreys, C. H.
Iddings, A. H.
Jenner, H. G.
Jewett, H. S.
Judy, C. S.
Keever, D.
Kimmel, H. S.
King, C. W.
Krauss, L. S.
Lichliter, D. C.
Mac Gregor, Chas.
Marshall, W. C.
McCassy, J. H.
McDonald, E. A.
Meyers, G. A.
Moist, A. R.
Mundhenk, W. S.
Patterson, C. L.
Pettit, R. R.
Plattfaut, Wm.
Ratliff, J. M.
Reeve, J. C., Jr.
Reilly, D. G.
Scheibenzuher, D. A.
Smith, Webster S.
Souders, Samuel.
Weaver, Fred C.
Weaver, J. M.
Weaver, W. P.
Williamson, A. M.

MORROW COUNTY MEDICAL SOCIETY

Auxiliary 1897.

H. S. Green .....President.
A. D. James.....1st Vice-President.
G. W. Morehouse.....2d Vice-President.
F. C. Griffis.....Secretary.
J. W. Wood.....Treasurer.

Honorary Members—J. F. Baldwin, Columbus; J. E. Brown, Columbus; A. M. Duncan, Bucyrus; W. Hamilton, Columbus; D. N. Kinsman, Columbus; F. C. Larimore, Mt. Vernon; W. J. Means, Columbus; R. H. Reed, Rock Springs, Wyo.; Aug. Rhu, Marion; G. M. Waters, Columbus.

MEMBERS

Bennett, W. C., Mt. Gilead.
Borden, A. L., Iberia.
Buck, A. H., Marits.
Dunham, C. C., Fulton.
Green, H. S., Cardington.
Griffis, F. C., Mt. Gilead.
James, A. D., Mt. Gilead.
Mateer, R. V., Mt. Gilead.
Moore, V. O., Sparta.
Morehouse, G. W., Sparta.
Neal, C. H., Cardington.
Pierce, R. L., Whitstone.
Sherman, E. C., Bennington.
Spear, R. C., Mt. Gilead.
Thompson, F. E., Marengo.
Virtue, D. B., Mt. Gilead.
Warmeling, C. T., Cardington.
Welch, Ella, Ashley.
Williams, J. W., Chesterville.
Wood, J. W., Mt. Gilead.

MUSKINGUM COUNTY MEDICAL SOCIETY

Auxiliary since 1894

J. G. F. Holston.....President.
C. Z. Axline.....Vice-President.
Anna M. Hill.....Secretary and Treasurer.

MEMBERS

Axline, C. Z., Fultonham.
Axline, F. A., Fultonham.
Bainter, M. R., Cambridge.
Bainter, R. B., Adamsville.
Bateman, W. C., Zanesville.
Cass, Edward, Dresden.
Chapplear, H. C., Hopewell.
Crider, C. C., Zanesville.
Davis, J. T., Zanesville.
Fassig, J. M., Zanesville.
Fleming, J. D., Frazersburg.
Geyer, H. R., Zanesville.
Geyer, J. L., Norwich.
Hanna, C. U., Zanesville.
Harris, H. M., Zanesville.
Hawk, Philip W., Zanesville.
Henderson, P. P., Zanesville.
Hill, Anna M., Zanesville.
Holden, J. L., Zanesville.
Holston, J. G. F., Zanesville.

Hosick, W. R., Adamsville.
Kelley, S., Zanesville.
King, F. J., Hoople, N. Dak.
Lane, G. W., Sago.
Leeper, J. L., Rural Dale.
Logsdon, E. C., Zanesville.
Mathews, D. J., Zanesville.
McCormick, G. W., Zanesville.
McCreary, H. M., New Concord.
Melick, John, Gratiot.
Melick, W. A., Zanesville.
Nye, H. S., Zanesville.
Peabody, Anna, Zanesville.
Prout, G. B., Dillon.
Rambo, C. M., Zanesville.
Sellers, C. P., Zanesville.
Sheppard, H. J., Zanesville.
Squires, A. W., White Cottage.
Sutton, H. T., Zanesville.
Templeton, A. M., Zanesville.
Templeton, B. F., Zanesville.
Warburton, G., Zanesville.
White, J. A., New Concord.

NORTH CENTRAL OHIO MEDICAL SOCIETY

Auxiliary since 1881 Annual Meeting in March

A. F. Hyde.....President.
C. E. Grimble.....Vice-President.
J. Lillian McBride.....Secretary.
A. H. McCuliough.....Treasurer.

MEMBERS

Anderson, M., Shelby.
Ash, L. B., Ashland.
Baughman, G. W., Mansfield.
Bertolette, H. B., Shreve.
Boles, R. S., Mansfield.
Carpenter, E. G., Columbus.
Chisholm, H., Marion.
Crane, A. M., Marion.
Crile, G. W., Cleveland.
Culler, J. F., Lucas.
Davis, M. J., Mansfield.
Denman, W. C., Marion.
Duncan, A. M., Bucyrus.
Eastman, N. R., Bellville.
Erwin, A. J., Mansfield.
Findley, S. E., Mansfield.
Finley, M. J., Mansfield.
Fitzsimmons, Jas. F., Bucyrus.
Griffith, F. C., Mt. Gilead.
Grubaugh, R. F., Mansfield.
Hall, B. O., Richwood.
Harding, B. F., Mansfield.
Harris, C. Jenner, Mansfield.
House, A. F., Cleveland.
Huffman, O. L., Galion.
Hyde, A. F., Shelby.
Kendig, E. V., Hayesville.
King, J. I., Martel.
Kipp, A., Mansfield.
Larimore, F. C., Mt. Vernon.
Lewis, R. M. C., Centerburg.
Loughridge, W. E., Mansfield.
Love, M. F., Shelby.
Maglott, John, Mansfield.
McArthur, J. A., Mansfield.
McBride, J. Lillian, Mansfield.
McCullough, A. H., Mansfield.
McMillan, D. C., Mansfield.
McMurray, A. B., Marion.
McNaul, John, Mansfield.
Myers, I. A., Shelby.
Nichols, J. H., Mansfield.
Potter, L. B., Fredericktown.
Race, C. W., Sandusky.
Rhu, August, Marion.
Roebuck, L. L., Richwood.

Roush, Frances A., Shelby.
Sattler, G. P., Mansfield.
Smith, H. H., Lexington.
Stevens, J. L., Mansfield.
Stewart, J. S., Mansfield.
Thomas, F. W., Marion.
Trimble, C. E., Crestline.
Uhler, A. P., Marion.
Wells, J., Marion.
Wenner, R. J., Cleveland.

NORTHWESTERN OHIO MEDICAL ASSOCIATION

Auxiliary since 1869 Annual Meeting in December

R. E. Jones, Gomer.....President.
W. A. Dickey, Toledo.....1st Vice-President.
B. S. Leonard, W. Liberty.....2d Vice-President.
J. P. Baker, Findlay.....Secretary.
T. M. Gehrett, Deshler.....Asst. Sec'y and Treas.

MEMBERS

Alford, N. E., Leipsic.
Anderson, W. V., Toledo.
Archer, J. D., Holgate.
Archer, J. R., North Baltimore.
Aris, James, Toledo.
Ashton, E., Lima.
Babcock, H. D., South Toledo.
Bain, F. D., Kenton.
Baker, J. P., Findlay.
Baldwin, F. J., Bluffton.
Banning, J. C., Belle Center.
Barrington, D., Rocky Ridge.
Bates, F. L., Lima.
Baxter, S. A., Lima.
Beaghler, A. C., Middle Point.
Beardsley, C. E., Ottawa.
Beardsley, C. O., Ottawa.
Becker, Bernhardt, Toledo.
Beckwith, S. W., Toledo.
Begg, W. H., Columbus Grove.
Beleau, Nettie, Defiance.
Belt, W. A., Kenton.
Benner, C. T., Tiffin.
Berlin, C., Wapakoneta.
Bessey, J. M., Toledo.
Binder, Albert, Ottoville.
Bird, S. H., Dupont.
Bishop, S. P., Delta.
Blaine, H. G., Toledo.
Blaine, S. P., Toledo.
Bland, J., Bucyrus.
Bloomfield, John, Napoleon.
Blue, N. S., Pettisville.
Bodman, L. H., Toledo.
Bolman, C. F., Coldwater.
Bond, J. W., Toledo.
Borman, Adam, Glandorf.
Bowen, A. D., West Lodi.
Bowen, Geo. W., Toledo.
Bowers, I. S., Perrysburg.
Bowman, J. L., Coldwater.
Bowman, M. H., Toledo.
Bralton, W. E., Payne.
Brattain, G. E., Payne.
Brayton, A., Carey.
Brayton, W. G., Fostoria.
Bricker, J. W., Fostoria.
Brigham, O. S., Toledo.
Brinkerhoff, D. H., Fremont.
Brooks, P. H., Lima.
Brown, H. H., Fulton County.
Brunthaver, Frank, Maumee.
Burritt, W. H., South Toledo.
Burton, E. G., Westminster.
Busch, Wm., Sandusky.
Byal, W. A., Findlay.

Calvin, J. H., Huron.
Cameron, Robert, Jewell.
Campbell, C. S., Tedrow.
Campbell, L. W., Ada.
Carey, M. J., Woodville.
Carrothers, M. M., Findlay.
Cessna, B. F., Kenton.
Chamberlin, D. P., Toledo.
Chapman, W. C., Toledo.
Cherry, Wm., Toledo.
Chesney, J. A., Bucyrus.
Chesney, J. M., Marseilles.
Chilcote, C. H., Bloomdale.
Clark, J. Fred, Toledo.
Clark, J. R., Bluffton.
Clevenger, R. E., North Washington.
Clippinger, J. S., West Cairo.
Cole, C. B., Grand Rapids.
Cole, C. S., Toledo.
Cole, W. C., Rockford.
Collamore, Geo. A., Toledo.
Cook, Alta F., Sandusky.
Cook, Henry, Hicksville.
Coombs, J. M., Defiance.
Cosgrave, Thomas, Toledo.
Coy, M. C., Defiance.
Cramer, W. S., Ohio City.
Craver, Belle, Toledo.
Crooks, R. L., Convoy.
Curry, John H., Toledo.
Curtis, C. L., Lima.
Darbyshire, M. A., McComb.
Davis, John, Gomer.
Davis, Samuel, Waterville.
Day, H. M., Pandora.
Demer, H. E., Castalia.
Denman, J. K., The Bend.
DeVilbiss, Allen, Toledo.
Dickey, W. A., Toledo.
Dimoke, Eli, Dupont.
Dine, C. L., Minster.
Dix, S. E., Van Wert.
Donnelly, James, Toledo.
Duncan, James A., Toledo.
Durbin, R. M., Woodville.
Eakin, T. E., Columbus Grove.
Entrikin, F. B., Findlay.
Evans, J. B., Ada.
Ewing, Frank, West Cairo.
Ewing, M. Jay, Findlay.
Faber, C. A., Toledo.
Fauster, John U., Paulding.
Files, C. A., Van Wert.
Finch, R. W., Defiance.
Firmin, F. W., Findlay.
Fisher, A. W., Toledo.
Fisher, W. H., Toledo.
Foltz, T. H., Lima.
Forbes, S. F., Toledo.
Gardiner, W. G., Toledo.
Gardner, John, Toledo.
Gehrett, T. M., Deshler.
George, E., Van Buren.
Gibbon, H. B., Tiffin.
Gillette, W., Toledo.
Glenn, L. C., Kenton.
Glenn, Mrs. G. C., Van Wert.
Godfrey, C. M., Ottawa.
Goebel, Anna M., Lima.
Good, H., Columbus Grove.
Graefe, Charles, Sandusky.
Green, C. S., Fostoria.
Greenfield, Edgar J., Haskins.
Guise, J. M., Findlay.
Guise, P. O., Findlay.
Haag, Harry P., Liberty Center.
Haines, J. B., Beaver Dam.
Haley, J. S., Napoleon.
Hamilton, H. A., Perrysburg.
Harmon, C. E., Delphos.
Harper, W. H., Lima.
Harrison, E. B., Napoleon.
Hartman, G. W., Wauseon.
Hasencamp, O. H., Toledo.
Hathaway, H., Toledo.
Hattery, J. E., Celina.
Havighorst, H. S., Toledo.

Haynes, Jno. T., Sandusky.
Heard, E. N., Sandusky.
Heaton, C. A., McCutchinsville.
Heckerman, J. U., Tiffin.
Hedrick, J. S., Dunkirk.
Heistand, E. B., Kenton.
Heller, F. S., Oak Harbor.
Heller, J., Grand Rapids.
Heller, Thos. F., New Washington.
Henderson, Geo. H., Vaughnsville.
Henry, A. G., North Baltimore.
Herrmann, S. S., Lima.
Hersh, E. G., McComb.
Hickey, W. H., Leipsic.
Higbie, J. L., Jenera.
Hill, Emily, Bowling Green.
Hill, W. W., Weston.
Hiner, S. B., Lima.
Hines, J. A., Van Wert.
Hitchcock, S. A., Elida.
Hixon, M. M., Dupont.
Hoag, D. E., Liberty Center.
Hoege, George L., Fostoria.
Holst, E. B., Haskins.
Hover, W. E., Lima.
Howell, J. A., McComb.
Hubbard, Thomas, Toledo.
Huber, H., Ottawa.
Huntley, J. H., Lima.
Hurd, A., Findlay.
Imhoff, C. E., Belmore.
Jenner, A. B., Arlington.
Jewell, N. W., Wauseon.
Jones, C. P., Nevada.
Jones, H. W., Van Wert.
Jones, R. E., Gomer.
Jones, W. A., Antwerp.
Kahle, A. W., Lima.
Kahle, R. D., Lima.
Keller, T. F., Tiffin.
Kimmell, J. A., Findlay.
Kimmont, T. C., Hicksville.
Kirkley, C. A., Toledo.
Kishler, W. G., St. Marys.
Kitchen, F. A., Toledo.
Ladd, L. E., Middle Point.
Landman, Otto, Toledo.
Lathrop, A. B., Swanton.
Laudick, L. F., Lima.
Lawless, J. T., Toledo.
Leever, J. C., Eaton.
Lenhart, P. J., Wauseon.
Leonard, B. B., West Liberty.
Leonard, B. S., West Liberty.
Levan, D. H., Mt. Victory.
Light, Frank, Ottawa.
Lisle, Lida, Celina.
Lisle, J. M., Columbus.
Long, J. W., Bryan.
Longfellow, A. J., Fostoria.
Longsworth, W. N., Van Wert.
Lusk, S. B., Waynesfield.
Lynch, Wm., Greenville.
Maerker, A. E. H., Napoleon.
Manville, A. J., Bowling Green.
Marsh, J. M., Delphos.
Martin, J. C., Findlay.
Matteson, D. E., Lima.
Mauk, E. B., Delphos.
McClung, J. C., Leipsic.
McConnell, D. W., Findlay.
McCoy, Clenn D., Kenon.
McCullon, E. J., Tiffin.
McGavren, G. W., Van Wert.
McIlvane, W. H., Kenton.
McKeller, A. P., Green Spring.
McKinley, Daniel B., Vaughnsville.
McKinley, E. B., Vaughnsville.
McLachlan, N. L., Findlay.
McLaughlin, C. C., Dunkirk.
McLeod, J. R., Findlay.
McMillen, Alex, Genoa.
McVety, Albert F., Toledo.
Merz, Chas. H., Sandusky.
Meyers, A. H., Carey.

Miller, C. S., Toledo.
Miller, James M., Menden.
Miller, W. L., Findlay.
Mills, C. H., Toledo.
Montgomery, W. H., Paulding.
Morgan, R. J., Van Wert.
Morris, Frank, Columbus Grove.
Morris, Joseph, Columbus Grove
Mumaugh, Shelby, Lima.
Munn, H. E., Toledo.
Munson, A. W., Kenton.
Murback, A. J., Archbald.
Murbach, E. A., Archbald.
Neville, W. S., Roundhead.
Newman, J. E., Gilboa.
Newton, C. W., Toledo.
Noble, H. E., Stoney Ridge.
Noble, J. G., Toledo.
Noble, Nathan T., St. Marys.
Nolen, J. G., Toledo.
Norris, M. M., Fostoria.
Norris, O. L., Deshler.
North, John, Toledo.
Nuding, W. H., Botkins.
Odell, Henry Edward, Toledo.
Paul, T. E., Ottawa.
Pence, Leroy, Celina.
Perkins, C. E., Sandusky.
Phelps, C. H., St. Marys.
Philips, D. P., Kenton.
Philips, W. S., Belle Center.
Pollock, S. J., New Hampshire.
Pontius, C. R., Fremont.
Potts, Charles N., Lima.
Powell J. E., Findlay.
Powell, W. S., Defiance.
Pugh, F. H., Bryan.
Radebaugh, P., Celina.
Ramsbottom, J. J., Wabash.
Reed, C. H., Toledo.
Reed, E. J., Leipsic.
Reid, C. B., Van Wert.
Reid, Charles, Continental.
Reid, J. L., Van Wert.
Reiff, Charles T., Fremont.
Reinfrank, J. H., Perrysburg.
Reinhart, J. C., Toledo.
Remeker, A. P., Maria Stein.
Reynolds, J. J., Defiance.
Rhu, Auguste, Marion.
Rice, Robert H., Fremont.
Richardson, D. H., Celina.
Richardson, E. O., Bowling Green.
Richardson, J. V., Ft. Recovery.
Ritchey, J. A., Oceola.
Robinson, F. B., Chicago
Rogers, J. A., Kenton.
Root, H. A., Toledo.
Roush, William, Spencerville.
Rudy, A. S., Lima.
Rush, D., Celina.
Sager, Joseph, Celina.
Sager, N., Jr., Herring.
Schlink, F. H., New Reigel.
Sexauer, C. F., North Robinson.
Shaffner, J. T., Willshire.
Sherrard, A. C., Broughton.
Shnetzler, H. M., Toledo.
Skinner, S. W., Toledo.
Slager, J. L., Paulding.
Small, W. W., Van Wert.
Smalley, W. M., Ohio City.
Smith, C. H., Kenton.
Smith, C. N., Toledo.
Smith, D. C., Dunkirk.
Smith, Wm., Van Wert.
Smith, W. M., Van Wert.
Snodgrass, Jesse, Kenton.
Souder, R. L., Nevada.
Speece, N. V., Quincy.
Stamm, M., Fremont.
Stancell, J. A., Forest.
Steiner, D. W., Lima.
Stemen, H. G., Delphos.
Stemen, W. E., Van Wert.
Steuber, F. G., Lima.
Steuber, L. J., Lima.

Stevens, M. B., Defiance.
Stewart, J. M., Oak Harbor.
Stewart, W. D., Toledo.
Stiener, Isaac F., Lima.
Stutsman, J. M., Van Wert.
Swimley, W. A., Forest.
Terwilliger, T. R., Lima.
Thacker, L. G., Defiance.
Thomas, O. H., Fremont.
Thomson, J. C., Rollersville.
Thorn, S. S., Toledo.
Thrift, J. T., Columbus Grove.
Tobey, H. A., Toledo.
Tracy, J. L., Millbury.
Tracy, J. L., Toledo.
Trovinger, John R., Arlington.
Tubbs, A. B., Weston.
Tuller, W. M., Bowling Green.
Tuttle, S. S., Van Wert.
Vail, J. B., Lima.
Van Note, W. B., Lima.
Van Pelt, C. L., Toledo.
Virtue, L. M., Sulphur Springs.
Waddick, J. M., Toledo.
Wagar, Chas. P., Toledo.
Wagoner, H. P., Delphos.
Walker, R. G., Toledo.
Walters, J. W., Ada.
Ward, E. L., Cridersville.
Waters, R. T., Lakeside.
Weadock, T. M., Lima.
Weaver, Philip, Coldwater
Wegg, John A., Oak Harbor.
Wert, L. J., Benton.
West, M. O., Mexico.
West, T. J., Tiffin.
Westrick, J. D., Defiance.
Wetherill, I. R., Bluffton.
Wilkins, J. A., Delta.
Wilkinson, E. L., Van Wert.
Willett, P., Elmore.
Willett, R. A., Elmore.
Williams, F. S., Kalida.
Williamson, M. S., Findlay.
Williard, G. P., Tiffin.
Wilson, S. R., Celina.
Wilson, Theron, Findlay.
Wilson, W. P., Findlay.
Winders, Frank, Columbus.
Windisch, John S., Port Clinton.
Wintermute, J. G. C., Celina.
Wood, W. I., Medina.
Woods, J. K., Van Wert.
Woods, J. T., Toledo.
Woods, Thos. E., Mt. Clemens, Mich.
Woodward, George, Oak Harbor.
Wordsworth, Miner, Hoytsville.
Wright, James B., Convoy.
Wright, John A., Toledo.
Yingling, George S., Tiffin.
Yoder, S. S., Lima.
Yost, W. N., Findlay.
Young, Nelson H., Toledo.
Young, P. B., Crestline.
Zebald, A. M., Hector.
Zedlitz, Arne, Toledo.
Zigler, H. H., Ayresville.
Zopfi, W. J., Findlay.

PERRY COUNTY MEDICAL SOCIETY

Auxiliary since 1897

J. D. Hayes ..... President.
B. F. Barnes ..... Vice-President.
J. G. McDougal ..... Secretary-Treasurer.

MEMBERS

Aurand, H. C., Dumontville.
Axline, C. Z., Fultonham.
Axline, J. D., Shawnee.
Barnes, B. F., Hemlock.
Barrow, C. A., New Straitsville.
Book, R. D., Corning.
Callinan, D. F., Corning.
Clemson, G. W., Thornville.
Clouse, Lewis, Somerset.
Davis, J. I., Shawnee.
Dennison, J. M., Blatchford.
Dupler, W. P., Crooksville.
Essington, U. K., Readington.
Folk, P., Deavertown.
Gordan, P. A., Junction City.
Hayes, J. D., Somerset.
Holcomb, C. B., Corning.
Holland, A. C., Mt. Perry.
Hutchfield, John, Moxahala.
Kennedy, G. L., Deavertown.
Lewis, W. G., Rushville.
Longstreth, W. E., Comly.
McDougal, J. G., New Lexington.
McTeague, N. T., New Lexington.
Moody, I. A., Junction City.
Norman, O. M., Roseville.
O'Farrell, M., Shawnee.
Richards, A., New Lexington.
Richards, R. L., New Lexington.
Sessoms, J. S., Rendville.
Stoneburner, W. H., Roseville.
Thomas, B. A., Rushville.
Trout, G. B., Dillon.
Walker, G. W., Roseville.
White, D. A., Thornville.
Winters, B. E., New Straitsville.
Wright, J. H., New Lexington.

PICKAWAY COUNTY MEDICAL SOCIETY

C. D. Briner.....President.
O. H. Dunton.....Vice-President.
G. W. Heffner.....Secretary.
Thos. Blackstone .....Treasurer.

MEMBERS

Allen, H. C., Circleville.
Blacker, Chas. E., S. Bloomfield.
Blackstone, Thos., Circleville.
Briner, C. D., Williamsport.
Courtright, D. V., Circleville.
Dunton, O. H., Circleville.
Hammel, M. H., Circleville.
Hatfield, C. C., Kingstown.
Heffner, Geo. W., Circleville.
Holman, A. W., Circleville.
Irwin, Samuel J., Tarlton.
Jones, Howard, Circleville.
Miessie, M. H., Circleville.
Miller, J. E., Darbyville.
Row, Geo. T., Circleville.
Shaeffer, A. H., Circleville.
Tipton, T. C., Williamsport.
Wright, T. B., Circleville.

PIKE COUNTY MEDICAL SOCIETY

A. Hutt.....President.
J. W. Obrist.....Vice-President.
J. L. Caldwell.....Secretary.
C. H. Wilson.....Treasurer.
Board of Censors—E. W. Lidd, W. S. Jones, O. C. Andre.

MEMBERS

Allard, L. D., Portsmouth.
Andre, O. C., Waverly.
Brown, E. O. S., Beaver.
Bumgarner, A. E., Piketon.
Caldwell, J. L., Waverly.
Dixon, E. M., Flat.
Heath, J. R., Grover Hill.
Hooper, W. H., Waverly.
Hunter, J. S., Piketon.
Hutt, Austin, Waverly.
Jones, W. S., Waverly.
Obrist, J. W., Beaver.
Ray, J. B., Omega.
Samson, H. M., Lancaster.
Samson, W. S., Lancaster.
Tidd, E. W., Flat.
Wilson, C. H., Idaho.
Windle, S. E., Latham.

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Spiers, H. H., Ravenna.
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Scott, D. H., Chillicothe.
Scott, W. S., Chillicothe.
Smallwood, E. H., Chillicothe.
Smallwood, F. M., Chillicothe.
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Geyer, J. D., Sidney.
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Yates, E. A., Kirkwood.

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Post, S. B., Canton.
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Wenner, R. J., Cleveland.
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Wise, S. P., Millersburg.
Woods, S. T., Loyal Oak.
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Wright, S. J., Akron.

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Auxiliary since 1879 Meets semi-annually in May and October.

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E. S. Stevens .....Secretary.
C. A. Hough .....Treasurer.

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Evans, F. R., Franklin.
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Evans, R. S., Franklin.
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